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None of Your Beeswax

What keeps a bee busy? Making combs and filling them with honey, right? That's how it's been for thousands of years. But Dr. Herbert Drapkin thinks it's time for a change.

Dr. Drapkin invented Perma-Comb, a solid plastic honeycomb. Instead of making wax to build a comb, bees can move right in. That way, Dr. Drapkin told CONTACT, they have more time to make more honey—and that's good for honey farmers.

Plastic combs are easier to empty than wax ones, and they're just about unbreakable. They also resist moths who munch on natural combs and cause headaches for honey farmers.

Not only that, says Dr. Drapkin, but bees take right to their new-fangled homes. That makes plastic combs sound like a pretty sweet deal.

ILLUSTRATION © PAT CLUMMINGS

No Strings

What do you get when you cross an electric guitar with a radio? Nope, it's not your favorite rock 'n' roll station. It's Lightning—the wireless electric guitar.

Why wireless? With wireless guitars, rock musicians won't be tied down or tangled up in electric cords. So they can run and dance freely all over the hall.

A built-in radio transmitter beams music from Lightning to an amplifier as far away as five football fields. Few guitarists will wander that far, though. If they do, their music will take so long to reach the rest of the band that they'll lose the beat.

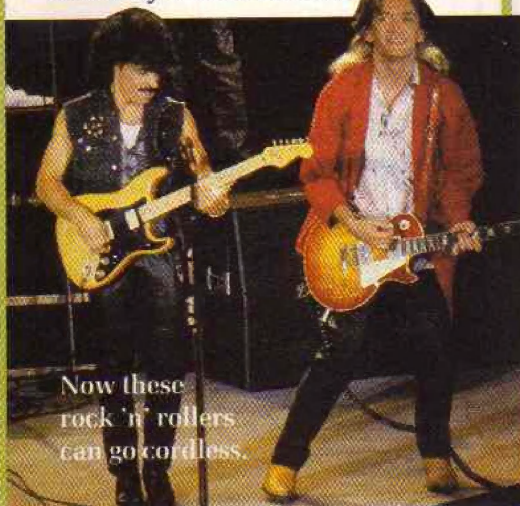


PHOTO © GANMAN BENSON

Now these rock 'n' rollers can go cordless.

shape an exact model of the missing bone.

Doctors use the models to help choose an artificial bone. If a person needs a replacement bone that fits precisely in a tight spot, the computers can help carve a new bone just for that person.

The bones are artificial, but the benefits are real—make no bones about it!

Key to the Future

In the future, you'll always have your house keys at your fingertips—because your fingertips will be your keys!

Fingermatrix, a White Plains, NY, company has invented a machine that reads your fingerprint right off your finger. If your print is in the machine's computer memory, the machine opens the lock.

Homes and cars aren't the only places that can be fingerprint-locked. One hotel has a fingerprint lock on the room where it keeps expensive wines. (Better hope Mom doesn't get any ideas about your fridge!)

New Bones About It

Without bones, a body would be a mushy mess. But sometimes, because of an accident or an illness, doctors have to remove people's bones.

Now computers can help people who've lost bones. A California company called Techmedica uses computers to design and

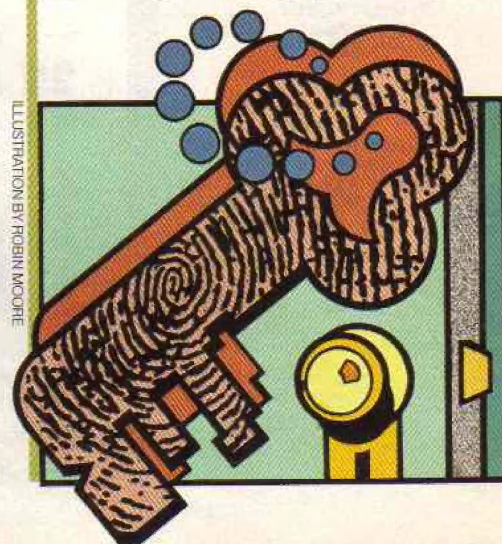


ILLUSTRATION BY ROBIN MOORE



PHOTO © ABC, INC.

"SpaceCamp" kids get more excitement than they expected in a new science fiction flick.

Space Flick Pick

Most CONTACT readers know all about the United States Space Camp in Alabama. It's a summer adventure in astronaut training for kids. (For information, call toll-free: 1-800-633-7280.)

Now, for kids who can't go to Space Camp, there's *SpaceCamp*—the movie! It's an adventure story about a group of Space Campers who accidentally blast off for real.

SpaceCamp may be the next best thing to Space Camp! The movie will be launched in local movie theaters this summer.

Listen to Your Lima Beans

"Help, I need some water!"

That's an S.O.S a plant might send, if it could. Now it can—thanks to an amazing computer gadget.

When plants are in trouble, their stems get extra thick or thin. Ceres is a computerized clamp that clips to a stem and measures the change. It'll help farmers make better use of water and fertilizer.

Nice Ice

Here's a cool item for summertime. Scientists have come up with a new kind of ice.

To test new ship designs, researchers sail model ships through miniature oceans. Miniature ice-breaking ships get tested in "ice tanks," like the 90-meter-long tank at the Institute for Marine Dynamics in Newfoundland, Canada.

But regular ice is too strong for the scale-model icebreakers to break. So scientists add a little sugar, detergent, and antifreeze to water, then freeze the mixture under special conditions. The result: scale-model ice for a model icy ocean. And it's weak enough for a model ship to break.

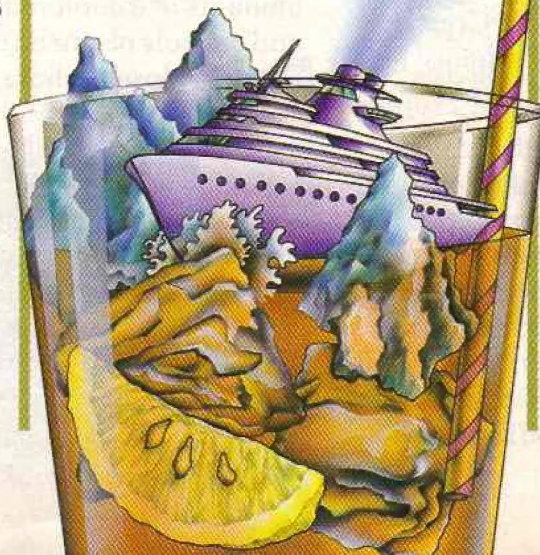


ILLUSTRATION BY MICHAEL HOREN



ILLUSTRATION BY PHIL ANDERSON

AM/FM/E.T.

Maybe your radio gets AM. Maybe it also gets FM. Maybe you even get shortwave broadcasts. You still can't hear what META hears.

META is a radio that listens to 8,400,000 channels at once—and every channel comes from outer space.

Dr. Paul Horowitz, a scientist at Harvard University in Massachusetts, hopes that META will someday pick up a message from intelligent aliens. So does Steven Spielberg, the inventor of E.T. He helped pay for META.

So far, most of the signals META has received are meaningless noise. But if there really are intelligent beings in space, how will scientists recognize their message signal? "I'm not sure," Dr. Horowitz told CONTACT. "If they're doing their job right, when we find it, we'll know."

So What's New?

You tell us and you'll get a nifty CONTACT T-shirt—if we print your story. Send us any science stories that have to do with the future. (Be sure to tell us where you got your stories.) Send to:

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The Whale Watch Kid

WHALERS WHO
HELP INSTEAD
OF HUNT

by Richard Chevat



PHOTO: STEVEN MORELLO/IMAGESHOTS

*Editor's Note: As you read this story you will notice some words in **dark type**. These words are clues for The Bloodhound Gang mystery.*

Anson Avallar has two families. One is pretty normal—his father Aaron, his mother Anna, and his brother Chad. His other family is a little different. Their names are Salt, Crystal, Falossa and Halos.

Anson's first family lives near the beach in Provincetown, Massachusetts. His second family lives out in the ocean a few miles away. But that's not really strange. After all, Salt, Crystal, Falossa and Halos are all humpback whales!

A Family With Flippers

How did Anson get a whale "family"? Well, his human family owns a fleet of whale watching boats called the "Dolphin Fleet." From April to November, the Avallars take hundreds of people out into Massachusetts Bay to see whales and other sea animals. Anson, who is 10, has been going whale watching since he was one year old!

During the summer Anson works in the boats' snack bars two or three days a week, serving hot

dogs and sodas. On his time off he likes to play tennis or baseball instead of whale watching. But he still enjoys seeing his "family" and lots of other whales.

"Salt was the first humpback that whale watchers got to know," Anson told CONTACT. "My father used to joke about Salt being his second wife. That's why I call her my second mother. Crystal, Falossa and Halos are Salt's calves—they're like my brothers and sisters."

Salt and her children arrive off the coast of New England every spring, along with hundreds of other whales. They come to feed on the large amounts of Zooplankton (microscopic animals) and schools of small fish. Sometimes they come so close to shore you can see them from the beach!

The humpbacks spend the winter in the **Caribbean**. But they don't work on their suntans. Whales are mammals—just like humans. They breathe air and give birth to live babies (**calves**). The humpbacks go to the Caribbean to have their calves. The warm waters help the young whales to survive during their first few months. You wouldn't think they'd need much help — each calf weighs about 1500 pounds

Right: This is Salt. Each humpback has different markings on its flukes.

PHOTO: CENTER FOR COASTAL STUDIES



Below: Anson on the bridge of the *Dolphin IV* with his grandfather.



PHOTO © DEBRA KAGAN

when it is born!

There used to be thousands of whales off the coast of New England. In fact, when the Pilgrims first landed in Massachusetts, humpbacks came and played around the *Mayflower*. But over the years so many whales were killed that most types of whales are now close to extinction.

A New Kind of Whale Boat

Today only about 150 humpbacks come to Massachusetts Bay. Instead of whale hunting boats, there are whale watching boats in New England, California, and other parts of the U.S. And humpbacks like Salt and her family are favorites among whale watchers.

"I especially like to watch them when they're active—like when they breach," says Anson. "That's when they jump out of the water. I also like to watch them eat. Humpbacks catch fish by blowing clouds of bubbles under water. The fish all swim to the surface and the whale comes up under them with its mouth open."

"Humpbacks have **baleen** instead of teeth," Anson told us. "It's like a giant strainer across their mouths. They just close their mouths around the fish and spit the water out ➡"

through their baleen. Then they eat the fish."

That baleen has to catch a lot of fish. The fish they eat are only 2-3 inches long. But the whales eat one ton of them everyday.

Name That Whale

Besides being fun, the whale watch trips help scientists learn more about the huge sea mammals. A scientist goes out on each trip and keeps a record of every whale that is spotted. They recognize the whales by the black and white markings on their flukes (their large tail fins). Each whale has its own pattern, like fingerprints.

Each whale gets a name to help the scientists keep track of them. Sometimes they are named after scars or other marks. A whale named Silver got her name because she is missing one of her flukes (probably lost in an accident with a boat). She was named after the one-legged pirate Long John Silver in the book *Treasure Island*.

By keeping track of the whales, scientists can learn a lot. For example, the scientists have watched Silver's calf, named Beltane, grow up and have her own calf. In this way, they have learned that humpbacks can have calves when they are five or six years old.

Of course, one of the main reasons for study-

ing whales is to help save them from extinction. "Whales may not be here in 30 years," says Anson. "That makes me sad."

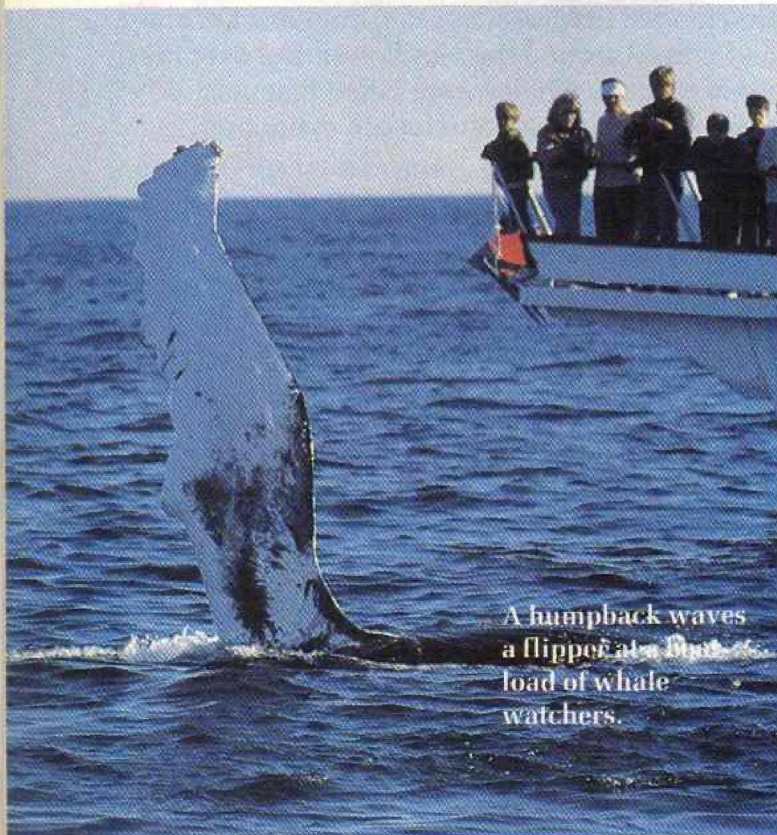
Phillip Clapham is one of the researchers who goes out on the whale watches. He is a scientist who works with the Center for Coastal Studies. We asked him why he studies whales.

"Whales are important for a few reasons," he told us. "First because they're a fascinating animal and we know so little about them. Second, because we owe them a lot. It's entirely because of us humans that they've almost been wiped out. By studying whales, we can learn how to help and protect them.

"Third, whales are a part of the same system we are part of. We depend on each other. If we don't save the oceans from pollution, and we don't save the whales from extinction, if we continue to destroy that system, then we'll destroy ourselves."

Whaleboat Cabin Boy

Sometimes the whale watchers can protect the whales just by being there. Anson told us about a time when the whale watchers saw three humpbacks being trapped in the nets of tuna fishermen. By sailing over to the fishermen, the whale watch boats were able to convince them



A humpback waves a flipper at a load of whale watchers.

PHOTO: ANIMALS ANIMALS KOLAR

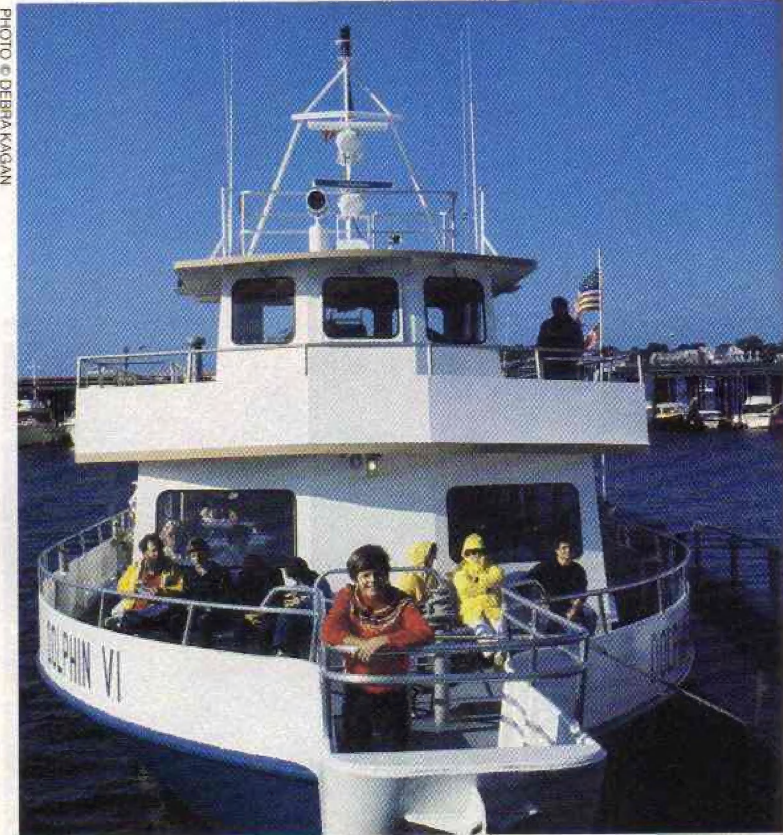
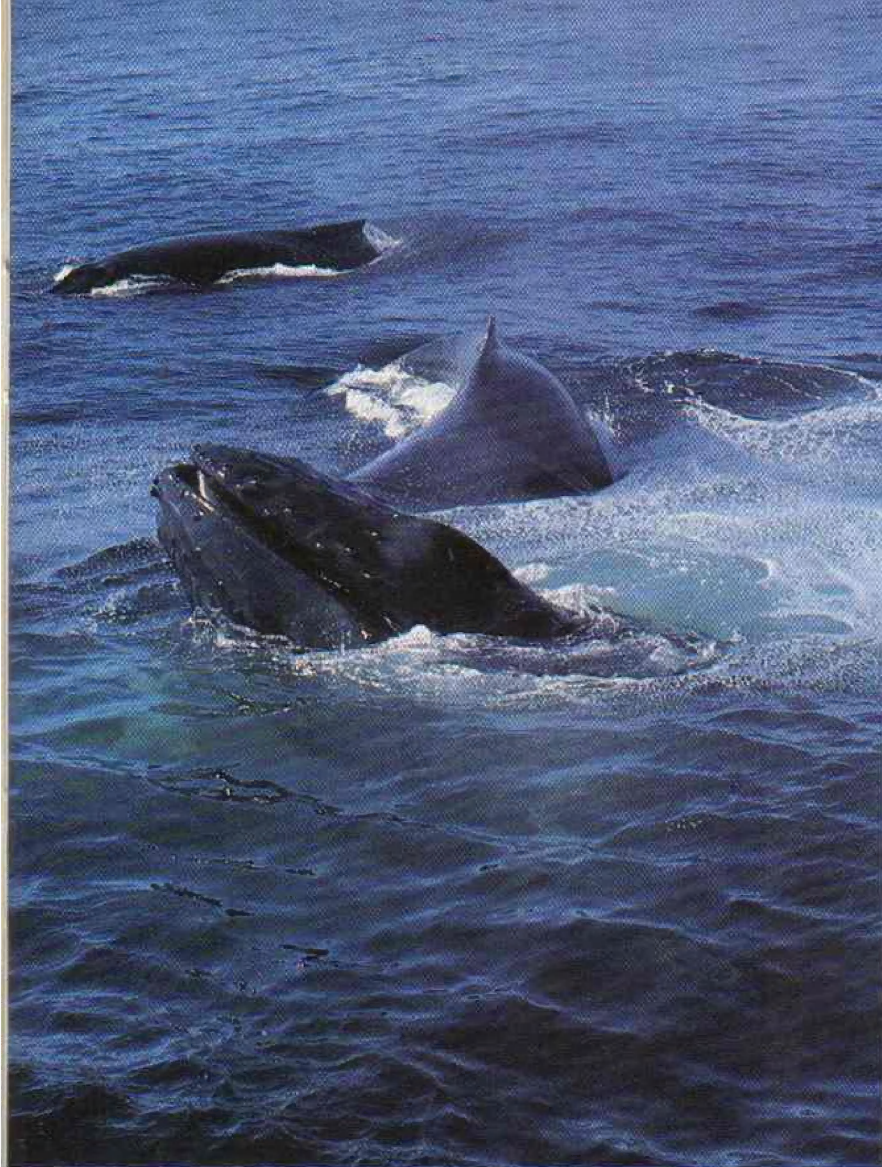


PHOTO © DEBRA KAGAN



to cut their nets and free the whales.

Besides humpbacks, Anson has seen fin whales, right whales, dolphins, seals and porpoises. Once he got to pet an **orca** (also called a **killer** whale). For some reason it decided to stay in Provincetown harbor for a few days. Anson helped his father take care of it until it left.

He even named his dog after a type of whale called minke (MINK-ee). The minke is a "small" whale. They "only" grow to be 30 feet long.

"I'm only an average whale spotter," Anson told us. "But I don't get seasick — except if there are 20 foot waves."

Anson has spent so much of his life looking at whales, it doesn't seem special to him. But every summer there are hundreds of folks who see their very first whale. When they see a 35-ton whale jump out of the water for the first time, it's something they'll never forget.


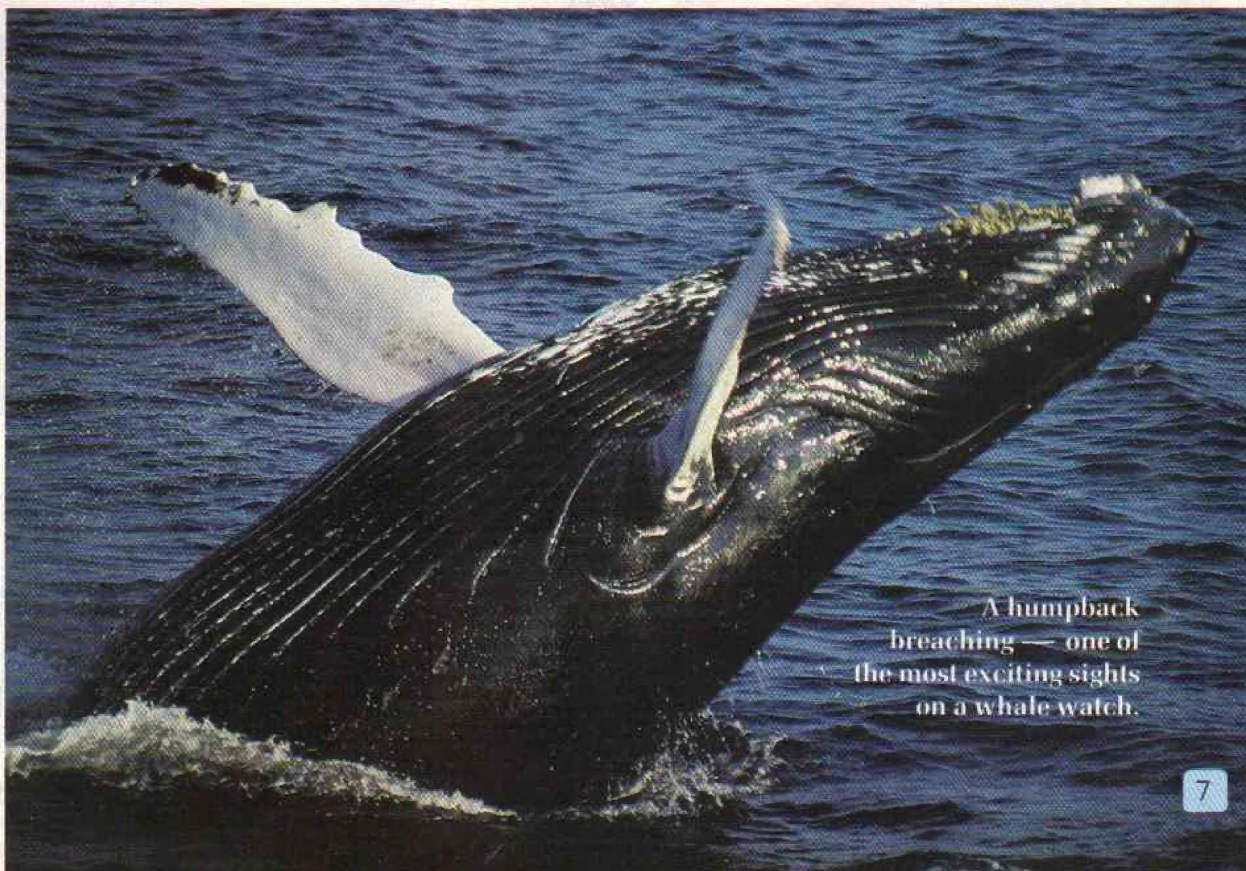
Anson hopes there will always be whales like Salt, Crystal, Halos and Falossa for people to come and see. And he has two families working on it — one with flippers and one with feet. 

PHOTO: HOWARD GARRETT

Above: These humpbacks are forcing fish to the surface by blowing bubbles.

PHOTO © STEVEN MORELLO/TAURUS PHOTOS

Left: Anson gets ready for another visit to his whale "family."

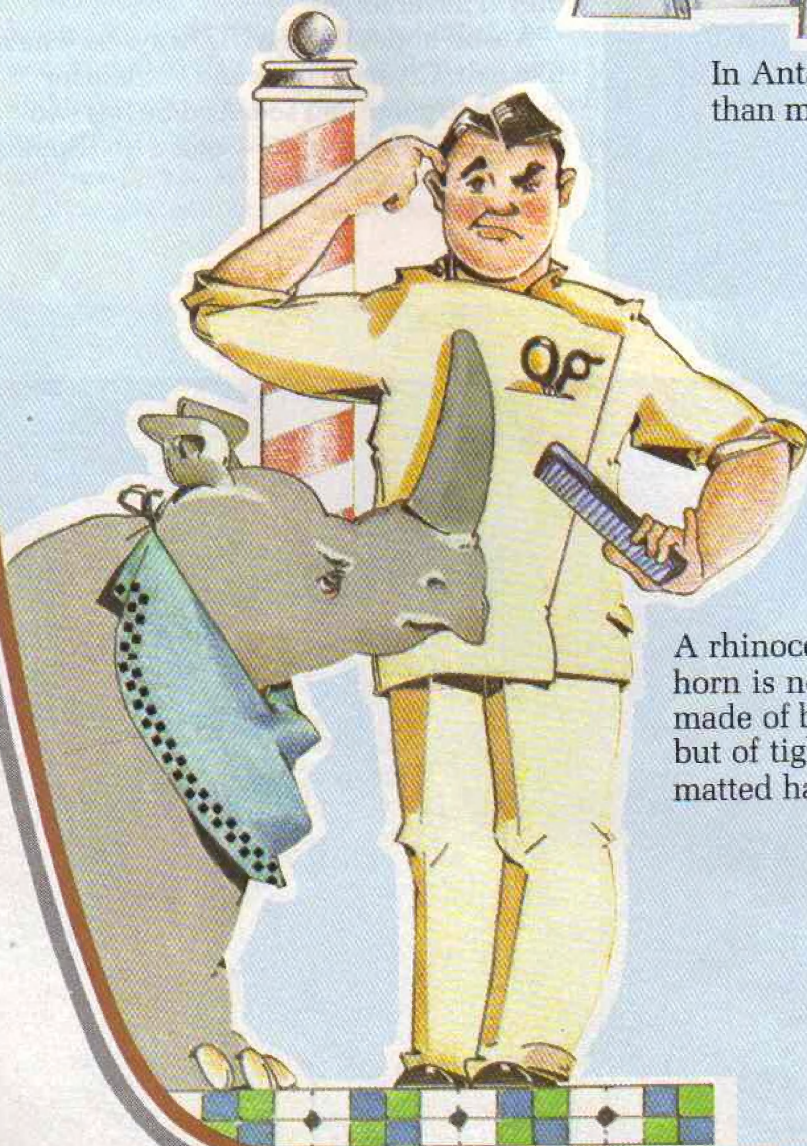


A humpback breaching — one of the most exciting sights on a whale watch.

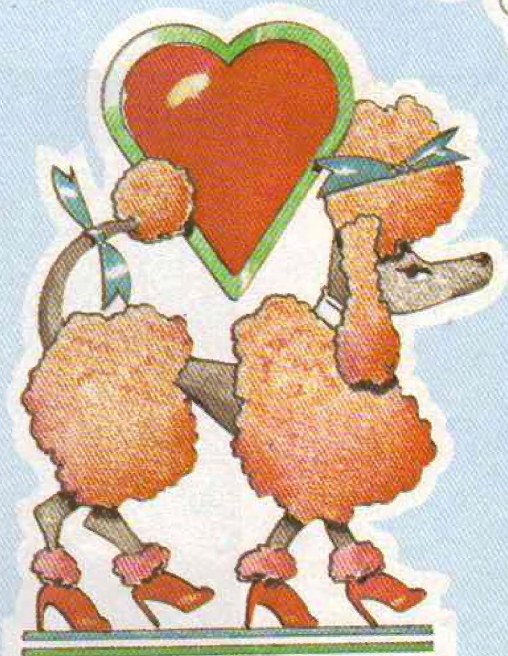
Factoids



In Antarctica, the temperature goes lower than minus 100°F (-73°C).



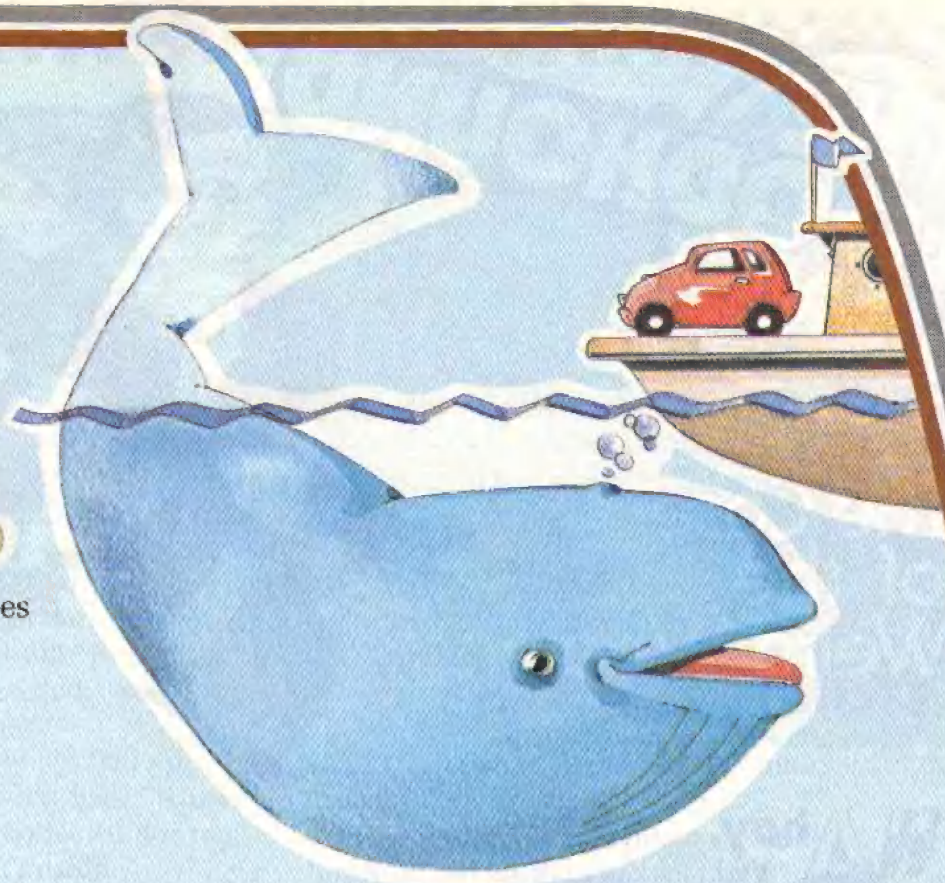
A rhinoceros horn is not made of bone, but of tightly matted hair.



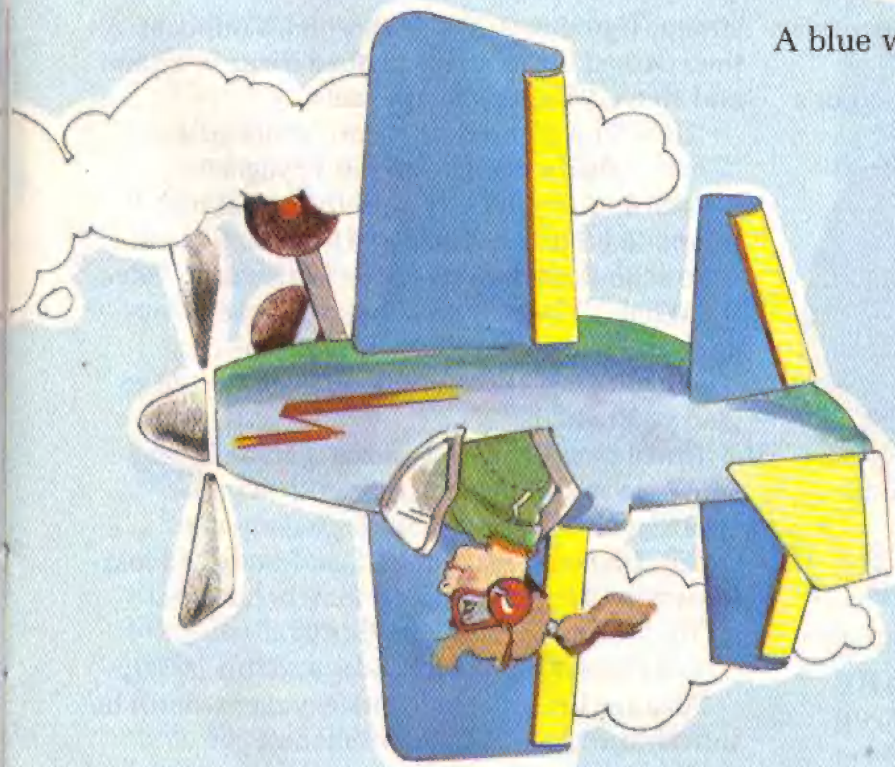
More Americans own poodles than any other kind of dog.



More than 27 billion potatoes were grown in Idaho in a single year.



A blue whale's tongue is as long as a small car.



The youngest pilot to fly alone was Betty Bennett. She was 10 years old at the time.



The largest pancake ever flipped was four feet, nine inches (1.4 m.) across.

THE BLOODHOUND GANG

The Case of the Weird Whaler

by Decky Cheston

ILLUSTRATIONS BY BOB PEPPER



"Ahoy, mateys!"

Vikki looked up from her desk and saw Ricardo standing in the doorway.

"Oh, no!" she groaned.

Ricardo was wearing a pair of shorts, a sailor's cap and a "Save The Whales" T-shirt.

"Ready to take to the high seas, me buckos?" he asked with a smile.

It was a muggy July morning, and so far the summer had been a busy one for the Bloodhound Gang. Vikki was ready for a rest.

"This had better be good," she warned.

"We're wanted at the wharf," Ricardo explained. "Something fishy's going on."

Vikki laughed. "Get serious," she said.

"This is serious," Ricardo insisted. "Someone's stolen \$3,000 from Voyager."

Just then Skip entered the office. "The Voyager?" he asked. "The whale watch boat?"

"That's right," said Ricardo. "So let's get going. The next sailing is in half an hour."

Skip looked nervous. "I don't know if I should. You know I get seasick."

Vikki got to her feet. "No way. We're a team, remember? When we tackle a mystery, we're all in the same boat!"

The Bloodhound Gang hurried down to the pier. They spotted Voyager and a long line of people were waiting to board her, excited about the chance of seeing real whales close up.

As the trio approached, Ricardo noticed a

strange figure wearing a fisherman's raincoat. As they passed the man, he grabbed Ricardo's hand and shoved a scrap of paper into it.

"Here," he grunted, as Ricardo backed away. "There's shady dealin's on the Voyager."

Ricardo started to say something, but just then he spotted Suzanne Mobley. He knew Suzanne from school. She was wearing jeans and a "Save the Whales" T-shirt. Suzanne worked on Voyager, and had called Ricardo about the case.

She ran up to the Bloodhound Gang. "I'm so glad you're here."

The old man had disappeared. Ricardo realized he was still holding the scrap of paper. Quickly, he shoved it into his pocket.

"Oh, hi, Suzanne," he said, suddenly at a loss for words. That happened a lot when he was around Suzanne. "I'm, uh, this is..."

Vikki saved him. "I'm Vikki, and this is Skip."

Suzanne took them aboard Voyager where she introduced them to Captain Shane Tyler.

"Welcome aboard," he greeted them. "Ready to catch a thief—and spot a few whales?"

Flippers and Skippers

One hour later, out on the ocean, they had almost forgotten about the theft. They had found a group of humpback whales,

and they were a wonder to see.

The huge, sleek creatures came close enough to the boat to gently touch its sides. The passengers were getting quite a show as the whales rolled in the water and waved their long white flippers. Meanwhile, Chester McGuinn, a whale expert, talked about the habits of humpbacks.

But Vikki was the only one watching. Skip was in the passenger cabin, very seasick. And instead of watching the whales, Ricardo was looking at Suzanne.

"This is great," thought Vikki. "One's seasick, the other's lovesick!"

Vikki grabbed Ricardo by the arm and dragged him over to Skip. He looked green.

"Let's talk business," she said. "Ricardo!!"

"Huh?" Ricardo looked startled. "Sorry, I was just thinking about something."

"Yeah, and I bet I know who," Vikki said.

Ricardo put on a business-like face. "Ahem, we know after the money is collected it is placed in a strongbox in the captain's cabin."

"Who has the keys to the strongbox?" asked Skip in a weak voice.

"Captain Tyler," Ricardo replied. "And Chester McGuinn."

"And Suzanne Mobley," said Vikki.

Just then there was a commotion on deck. All the passengers rushed to the rail. They had spotted another group of humpbacks, only this group was in trouble!

A Fluke Accident

Skip rushed outside. "They're trapped!" he shouted.

Somehow, the whales had been caught in the net of some tuna fishermen. Chester McGuinn explained to the worried passengers how such a thing could happen.

"It's unfortunate," said McGuinn, "but a whale is a big, greedy fish. It especially loves tuna, because that's one of the biggest fish the whale can sink its teeth into."

"Skip!" whispered Vikki. "Stop being rude!" Skip was staring at McGuinn.

"You know," Ricardo said to him, "I think I have some seasickness pills." He reached into his pocket and took out a bottle of pills.

Just then Suzanne walked over to the gang. "What's this?" she asked, and picked a crum-

pled piece of paper off the deck.

"Oh," said Ricardo, "Some strange guy down on the pier gave that to me." Ricardo described the old fisherman. "He looked pretty crazy."

"You're the one who's crazy!" shouted Suzanne. Ricardo's face turned bright red. "That was Salty Pete! He knows everything that goes on around here!"

"Let's see that," said Vikki, taking the note from Suzanne. "It's a puzzle!" she announced.

"The largest animal that walked, swam or flew. My name is _____ and your first clue.

"Hi diller diller, this one's a killer. Don't be a dork-ah, just follow the _____.

"Your quest is over by more than a half. Now find the place where a humpback has a _____."

"What does that mean?" Suzanne said in dismay. "Ricardo, do you know?"



Ricardo took a breath. "Me? Sure, uh...uh,"

"I know," said Skip, in a weak voice. He looked worse than ever.

STOP! Before Skip solves Salty Pete's puzzle, turn to "The Whale Watch Kid" and our whale poster. Can you find the answers there?

Skip led them back to the passenger cabin. He stood in front of the door.

"Here's where we start," he said.

"What? How come?" asked Suzanne.

"What color is the door?" asked Skip.

"Blue."

"Yeah," said Skip. "I've spent the past ➡

hour looking at it. Now, what is the largest animal that ever walked, swam or flew?"

"The blue whale!" cried Vikki!

"I knew that," said Ricardo, trying to get Suzanne's attention.

"Okay, so we start by the blue door," said Skip. "Now follow me."

They followed Skip as he climbed the stairs to the upper deck. He stopped halfway up.



ILLUSTRATION BY BOB PEPPER

"Now, what do you see?" he asked.

"Just an old oar," Ricardo replied. There was an old oar mounted on the wall.

"Wait a minute," said Vikki. "Oar, orca—orca is another name for killer whale!"

"That's right, the second clue. And the oar points up the steps," said Skip.

"I knew that," said Ricardo.

At the top of the steps was the bridge. Captain Tyler and Chester McGuinn were there.

"Hi, Captain," said Skip. "Stick around, both of you. I think we've solved the mystery."

Skip Spouts Off

"What now?" asked Ricardo. "The last clue mentions humpbacks. I don't see any up here."

"No," said Skip. "But the answer to the last clue should rhyme with 'half.' What if the answer is 'calf,' or baby whale? Where do humpbacks go to give birth?"

"The Caribbean," said Vikki. "But I don't see..."

"I know!" shouted Ricardo. "The thief flew to the Caribbean!" He looked at Suzanne proudly.

"Hmmm, maybe," said Skip. He walked to a map of the Atlantic Ocean on the wall. "Here's

the Caribbean," he said, putting his finger on that part of the map. "Look, there's a panel!"

Skip slid part of the map back and there was the missing money!

"Fantastic!" shouted Suzanne.

"Not so fast," said Vikki. "We still don't know who the thief is."

"I do," said Skip.

He looked at Captain Tyler, then Chester McGuinn and finally Suzanne.

"I know one of you is a phoney," he said.

"Why don't you just confess?"

STOP!! Who is Skip talking to, and how does he know he or she is a phoney? Look in "The Whale Watch Kid" for the answers.

"Confess, McGuinn," Skip was saying.

"You're no whale expert."

The phoney expert backed up towards the door, but the captain grabbed him.

"How did you know?" asked Suzanne.


"Well, he doesn't know much about whales," explained Skip. "He called them fish, but whales are mammals. They breathe air."

Vikki jumped in. "He also said they like to eat tuna, but humpbacks only eat small fish."

"That's right," nodded Skip. "And they can't sink their teeth into anything—they don't have teeth. Instead, they strain food from seawater through their baleen. And, and..."


Suddenly Skip rushed from the cabin and ran to the railing. He leaned over the side.

"Well," said Vikki, laughing. "At least we found the money."

"Yeah," said Ricardo. "But it looks like Skip has lost his lunch." 

**Watch for next month's
Bloodhound Gang
mystery!**





The fashion
NEWS
this fall is **FUN!**


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Science Sizzles This Summer

AT KIDS' MUSEUMS ACROSS THE U.S.

Quick! When someone says the word MUSEUM, what do you think of? How about a place where you can make noise, touch anything (and everything), climb through life-sized models, see movies on giant screens and have FUN? Believe it or not, there are science museums all over the U.S. where you're not only allowed to do those things, you're supposed to! Here's a look at some "hot" museums you may visit this hot summer.

by Debra Glicksman

PHOTO BY LOUIS SCIENCE CENTER



At the St. Louis Science Center in Missouri, visit Theremin, the sound synthesizer. When you place your own hands near the brass, you interrupt an electronic field and create sound. Move your hands around to change the pitch and make your own kind of music.

PHOTO PACIFIC SCIENCE CENTER SEATTLE

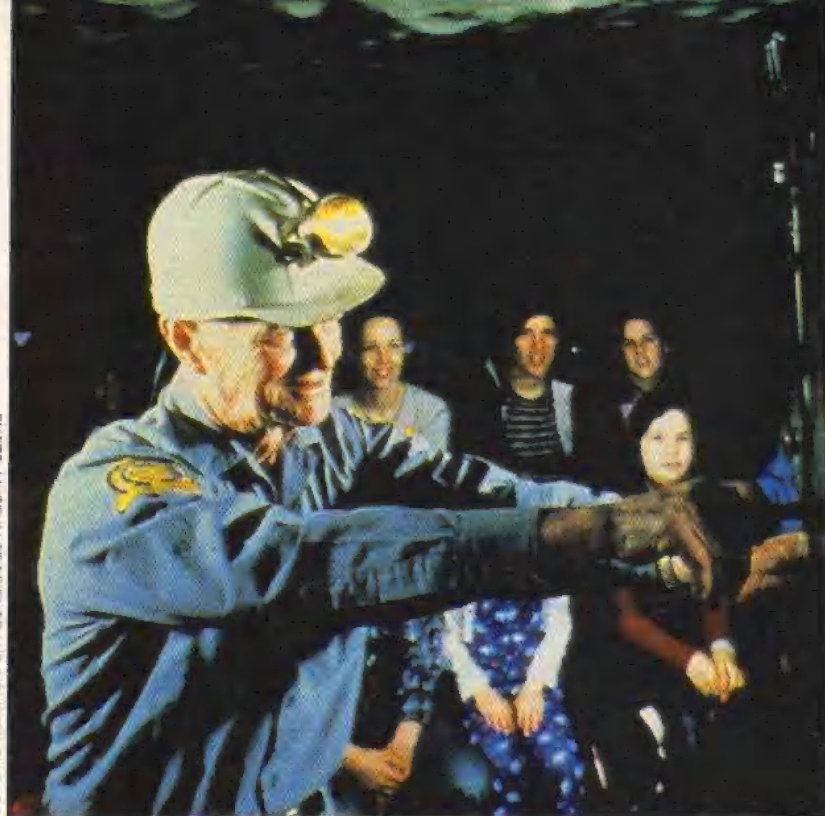


Visitors to the Pacific Science Center, in Seattle, Washington, can play with a "Bernoulli Ball." This ball stays suspended above visitors' heads by a constant jet of air.

Kids can leave a rainbow behind them at the Exploratorium in San Francisco. In the Recollections exhibit, a video camera takes a picture of your outline in front of a special material that bounces light back. A computer stores up to 16 outlines and gives each a different color. Presto—your shadow fills the room in a variety of colors.

In Chicago, at the Museum of Science and Industry, you can walk through a huge beating model of the human heart, a full-sized coal mine or a submarine.

PHOTO: MUSEUM OF SCIENCE AND INDUSTRY, CHICAGO



Go inside the Giant Egg at the Museum of Science in Boston, Massachusetts. There you can see how eggs become chickens. You can even hold a baby chick.



PHOTO: THE CHILDREN'S MUSEUM, INDIANAPOLIS

The Indianapolis Children's Museum has a Natural Science Hall. There, you can explore a limestone cave, walk through a marsh or even pet a snake.



PHOTO: MUSEUM OF SCIENCE, BOSTON

MUSEUMS



Now that you've discovered what's going on in some museums around the U.S., check out our map. It shows the locations of these and other museums. Each has lots of stuff for the entire family to see and do.

What's that? You're not going anywhere this summer? Well, one of these museums may be near where you live. So pay it a visit!

Pacific
Science Center

WA

Seattle

Museum of Science
and Industry

OR

Portland

The
Exploratorium

San Francisco

CA

Museum of Science
and Industry

CA

Los Angeles

The Space
Center

Alamagordo

NM

Omniplex—Science
and Arts Museum

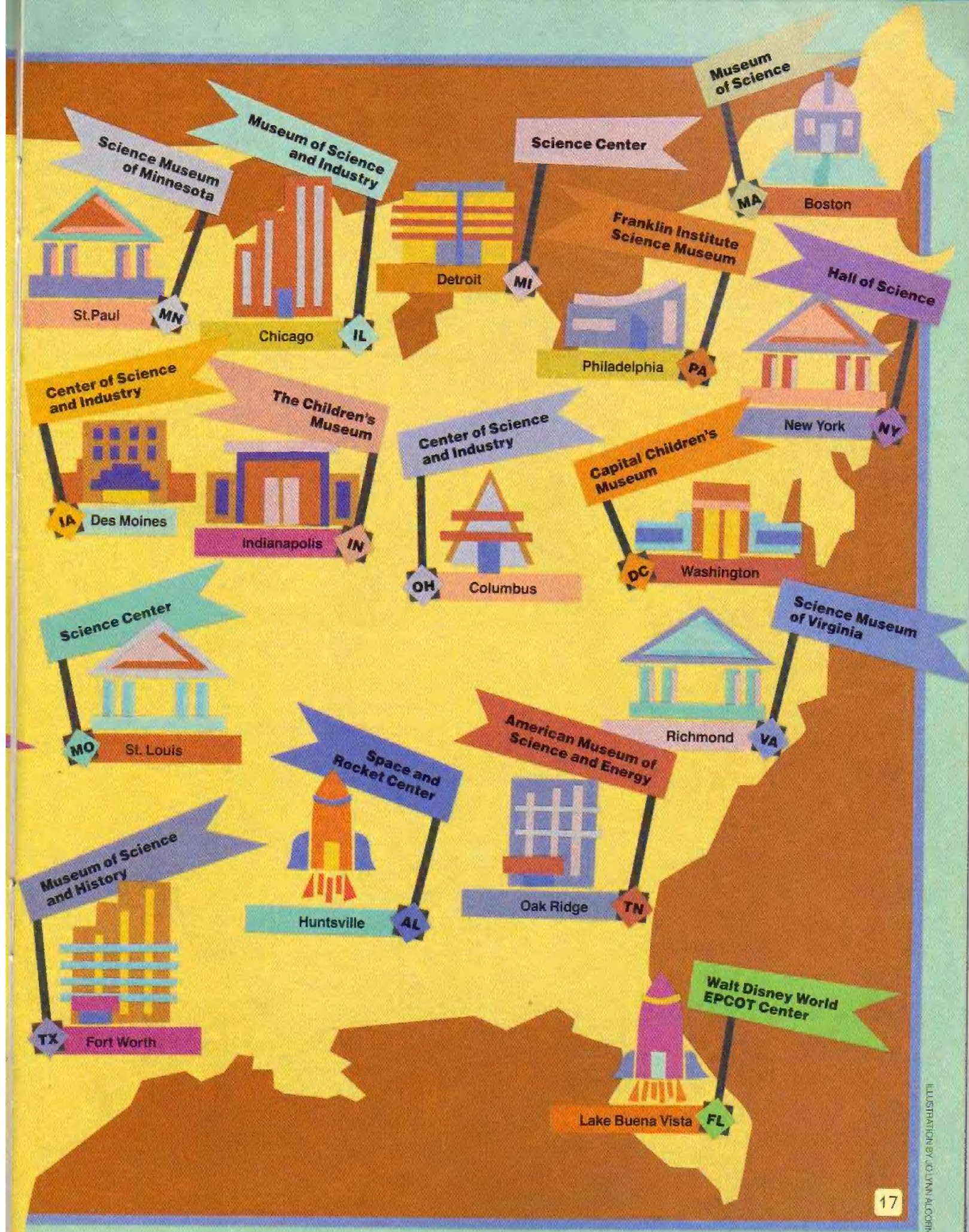
OK

Oklahoma City

Name That State

As you're traveling over the map, can you solve the vacation state riddle and come up with our mystery state? Check the Did It! page for the answer.

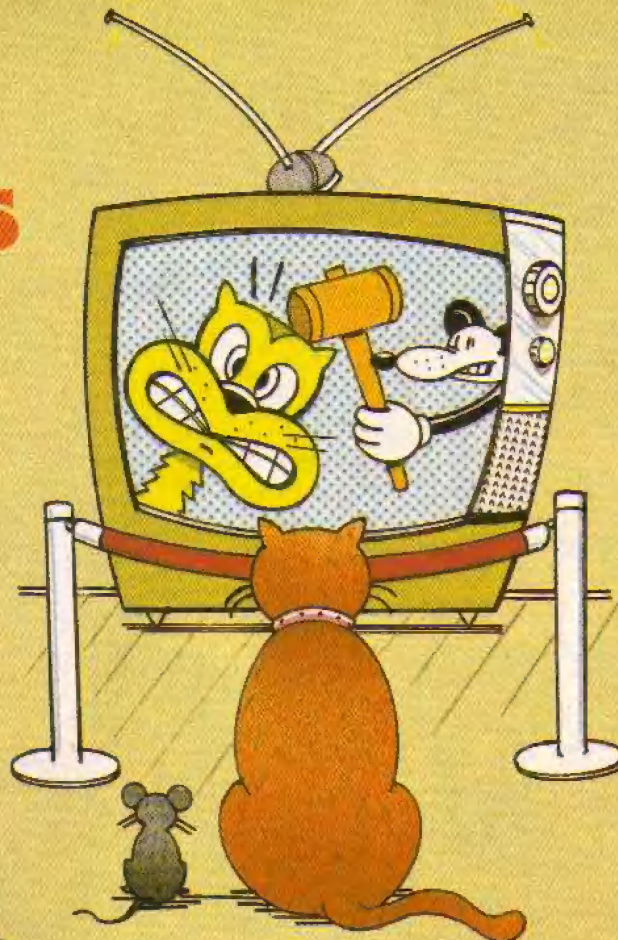
1. The "Golden State's" motto is Eureka! (I found it!)
2. Avocados, grapes and microchips keep this state in the chips.
3. This state is the original home of Mickey, Donald, Pluto and Minnie.
4. You can find Bristlecone pine trees here. The trees are 4,600 years old.
5. Our mystery state is _____.



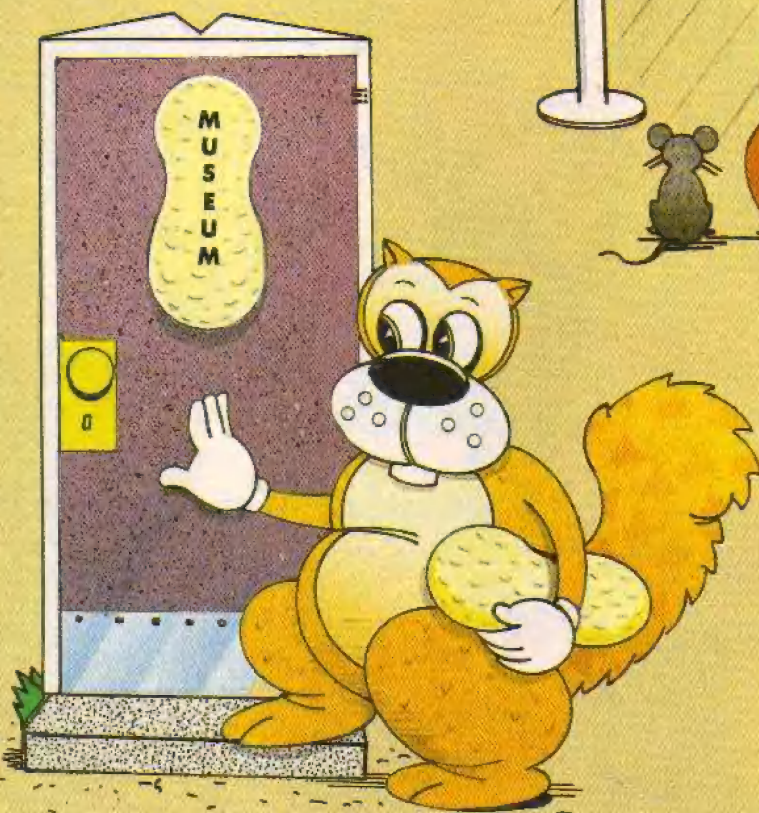
Wacky Museums

by Michael Dayton

A museum devoted to dogs? A museum that honors the noble nut? You bet! Sit back and relax as 3-2-1 CONTACT tours the U.S. in search of some very strange museums!

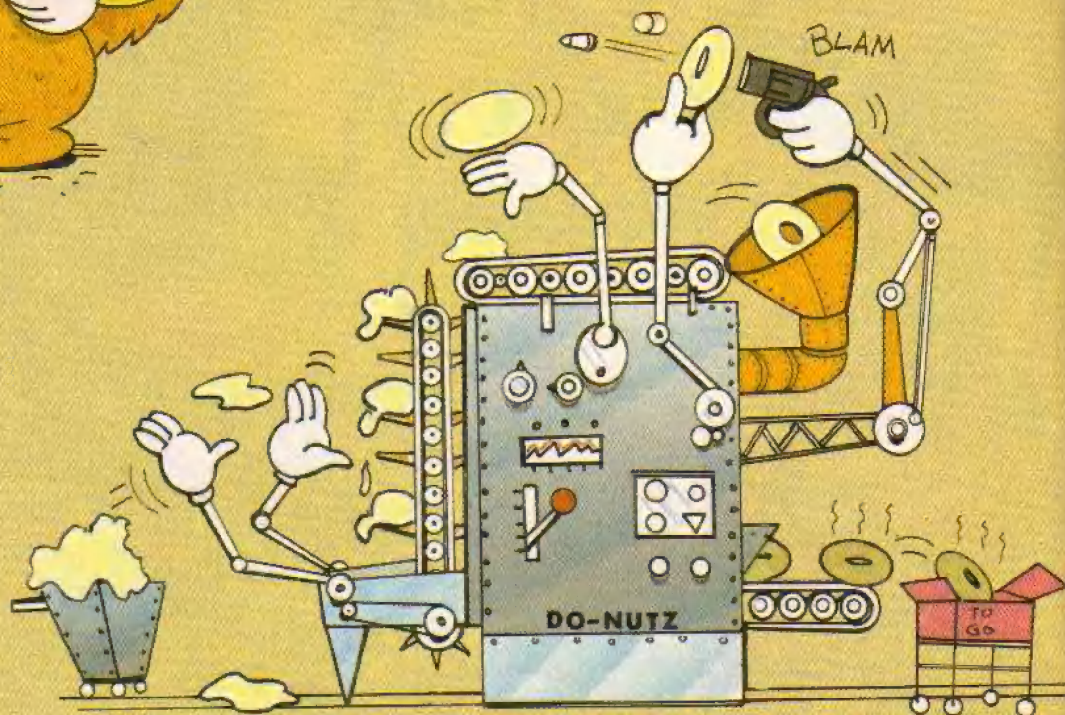


TV Turn On Who says too much TV is bad for you? Certainly not the Museum of Broadcasting in New York City. There, you can find more than 20,000 historic radio and TV programs. The museum is run like a library. You can choose a program from the catalog, then watch or listen to it at one of 40 booths. Here's to Lucy Ricardo, Beaver Cleaver—and Bugs Bunny!



Model Marvel The Patent Model Museum in Fort Smith, Arkansas, has 80 models of inventions made for the U.S. Patent Office. Exhibits include a bed that looks like a ship. It even has oars and supplies tucked under the mattress. Like many of the inventions at this museum, the bed never made it big. Sleepers got seasick every night!

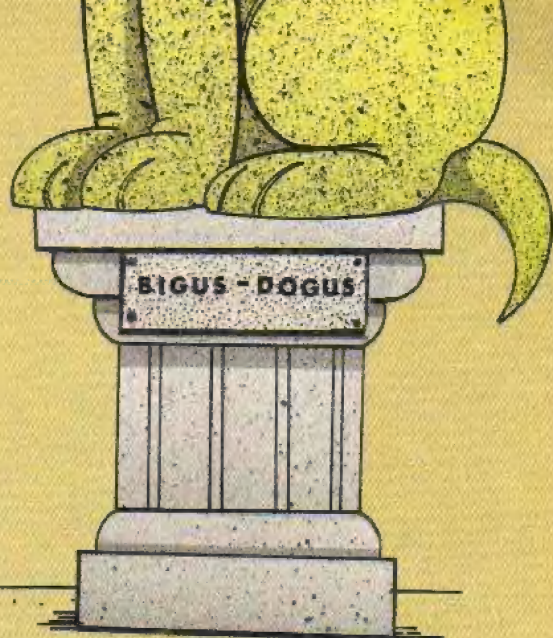
Nuts to You! People who visit the Nut Museum in Old Lyme, Connecticut, are really nuts about nuts. The museum has paintings, songs and sculptures of nuts and nutcrackers. The weirdest nut in the collection is a 35-pound double coconut. There's also an outdoor nut garden. However, that exhibit must be constantly replaced—the squirrels and chipmunks raid it daily.



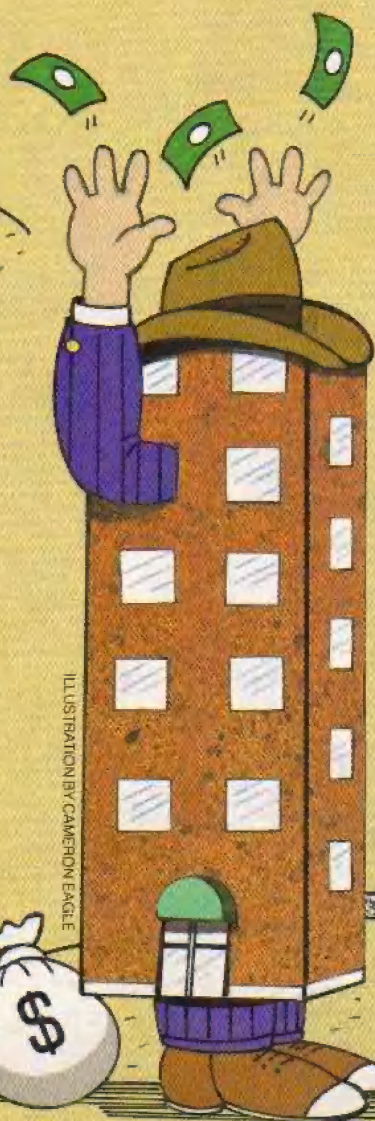
Clowning Around Visitors ease into a trapeze at the Ringling Museum of the Circus in Sarasota, Florida. Big top lovers can see antique circus wagons and posters from the old days of the traveling circus. There's even a miniature circus and a circus Hall of Fame.



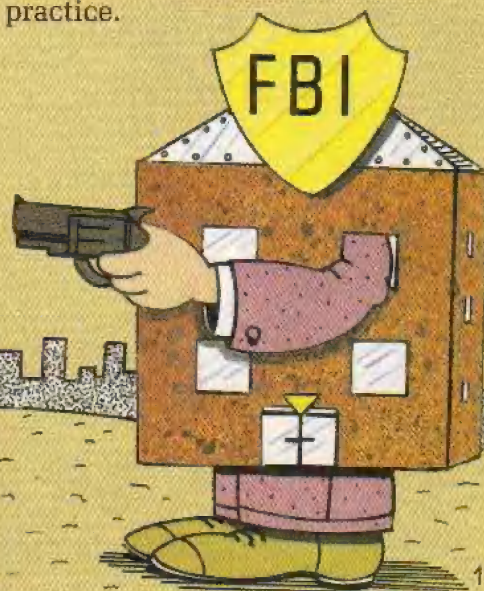
It Takes a Thief John Dillinger was one of the most famous bank robbers of the 1930's. Visitors to this very odd museum in Nashville, Indiana can see hundreds of Dillinger's personal items—including his lucky rabbit's foot and the trousers he was wearing the night he was killed. Why would anyone want to visit this museum? Probably to try to figure out why anyone would rob a bank in the first place!



One for the Dogs Here's a place that has really gone to the dogs. It's the Dog Museum in New York City. Paintings, sculptures and photos of human's best friends are all here. Recent shows have focused on dog sleds and mummified dogs from Egypt. Recently, the museum held a fashion show where pooches modeled dog duds. Talk about a dog's life!



Secret Agent If you're into who-dunits, then the museum in the FBI Building in Washington, D.C. is just for you. Super-sleuths learn how loaded dice work, and visit a lab where blood samples are analyzed. There's also plenty of noise at this museum. Just walk into the indoor shooting range and see FBI agents at target practice.





Killer Whale

This whale feeds on seals, fish and other whales, but does not attack people.



Gray Whale

Gray whales travel along the Pacific coast from Mexico to Alaska. When migrating, they can often be seen from shore.



Blue Whale

This is the largest animal ever to have lived. It can grow to be 100 feet long. It lives on tiny microscopic animals.



Narwhal

The narwhal's "horn" is really a tusk. It lives in Arctic waters.



Humpback Whale

Humpbacks are famous for their "songs." All the male humpbacks in an area sing the same song.



Bottlenose Whale

This whale grows to about 30 feet and lives in the North Atlantic. It eats fish and squid.

Whales of the World



Sperm Whale

The sperm whale eats giant squid. It can dive as far as half a mile and can hold its breath for 45 minutes.



Right Whale

The right whale has been hunted so much it is now very rare. It can grow to be 55 tons. That's 110,000 pounds!



Piked Whale (Minke)

This is a "small" cousin of the blue whale. Like the blue, it has baleen instead of teeth.



Baird's Beaked Whale

This rare whale grows to about 40 feet in length. It lives along the Pacific coast of North America.



Liberty Weekend

by Ellen R. Mednick

Lady Liberty's going to have the time of her life at a four-day birthday party complete with fireworks, the tallest ships in the world, 50 blaring trumpets and an all-star show. That's what's planned for the Statue of Liberty to celebrate her 100th birthday. The party will take place July 3-6. If you can't attend the big bash yourself, don't worry. Most of the events will be covered on TV. Here's the latest on Liberty Weekend '86.

Welcome

On Ellis Island, the place where many immigrants first landed, 5,000 people will be sworn in as new citizens of the U.S. At the same time, across the country, 20,000 other immigrants will also become new Americans.

Lights Up!

President Reagan will be in New York. He'll start off the birthday salute by turning on a string of lights that will stretch across the water to the Statue of Liberty. (Since the repair work began in 1983, the Statue has stood in darkness.)



Operation Sail

More than 300 sailing vessels including 18 of the world's Tall Ships, will fill New York Harbor. Operation Sail '86 will be the largest parade of sailing vessels in history.

Fireworks!

That's the name of the game at Lady Liberty's party. The special extravaganza planned for July Fourth is expected to be the largest fireworks show in U.S. history. It will include lasers, gigantic water fountains and special lighting effects.

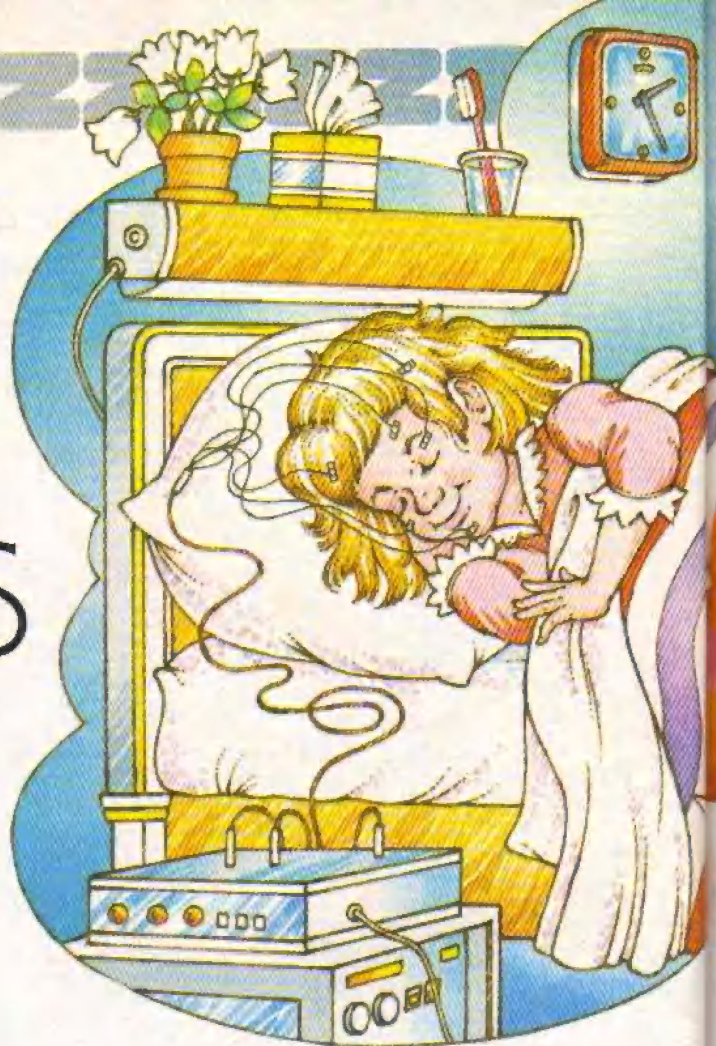
Did You Know?

- ★ Kids have raised over \$4,000,000 to restore the Statue of Liberty and Ellis Island.
- ★ The Statue, including the base and the pedestal, is 305 feet tall and weighs 450,000 pounds.
- ★ Lady Liberty's crown has seven spikes which represent the seven seas and continents of the world.
- ★ The Statue of Liberty's mouth is three-feet wide. Her nose is 4 feet, 6 inches long.

Sleep

THE MYSTERIOUS THIRD OF YOUR LIFE

by Joan Graf



At the end of every day, you do something very mysterious. You stretch out on your bed, snuggle under the covers and close your eyes. Then, before you know it, you're asleep! Your mind seems to have gone away somewhere on vacation, leaving your body on the bed.

Like all sleeping people, you look very quiet. But inside your brain, a lot of activity is going on. Of course, you won't remember what was happening when you wake up, although you may recall some dreams. But to really understand the mystery of sleep calls for more than the memories of sleeping people. It requires careful study by scientists called *sleep researchers*.

Tracing Brain Waves

The study of sleeping takes place in a sleep laboratory. Its plain small rooms equipped with beds make it look very different from a regular science lab. The most important equipment is a machine called an *EEG*. (That's short for *electroencephalograph*!) Researchers use it to study a sleeping person's brain.

The brain doesn't make sounds. But millions of

brain cells use electrical signals and special chemicals to send messages to different parts of the body. The EEG machine can measure these electrical signals or *brain waves*.

First, a person who is taking part in a sleep study lies down on one of the lab beds. Then she gets connected to a machine. A researcher attaches wires on the surface of her scalp, chin and forehead. Other wires go near her eyes and nose. These wires don't hurt the person in any way. At the other end of the wires is the EEG machine and other machines which measure breathing and heart beats.

The EEG is turned on. Then researchers wait for the person to fall asleep. Even before she begins to doze, the EEG picks up her brain wave signals. As it does, the machine traces a pattern of squiggly lines on a piece of paper. During the whole experiment, the machine keeps tracing. By the time the sleeper wakes up, there is a long piece of paper. It is filled with squiggles. These lines are an important clue to what was happening while that person slept.

Reading the Squiggles

Sleep experts study EEG patterns. They now



know that there are five basic brain wave patterns. Each goes along with a different stage of sleep. Everyone—including you—goes through these stages every night.

When you first start to drift off, you are in stage one. From there you go into the deeper stages. In the stage of heaviest sleep, you are completely still for 10 or 20 minutes. Then you slowly drift back through the lighter stages.

But instead of waking up, you enter into the most mysterious stage of sleep. Your eyes move quickly from side to side beneath your closed eyelids. (If you have ever watched a sleeping person for a while, you may have seen his eyeballs darting back and forth. You may have even watched this happening to your dog or cat!)

The movement gives this stage the name “rapid eye movement” sleep, or *REM sleep* for short. A researcher named Dr. William Dement noticed that certain brain wave patterns happen during REM sleep. They look a lot like your brain waves when

you are awake. But this stage is very different in other ways from being awake. Your eyes dart. Your hands and face may twitch a little. But the large muscles of your body are paralyzed.

Most of your dreams take place during REM sleep. Some people think your eyes dart around because you are following the action in your dreams. But no one knows for sure yet.

Scientists also don't know why we have REM sleep, but we do seem to need it. When people were kept from getting REM sleep during experiments, they became grouchy and nervous. Some of them couldn't concentrate well. And after these people were allowed to get REM sleep again, they needed more than usual for a while.

Babies spend about half their sleep time in the REM stage. This is much more than the amount of REM time that adults need. Some people think babies need more because REM sleep helps the brain to develop. ➡





The World of Dreams

You have several dreams every night. The early ones usually last only a few minutes. But the dream that you have in the early morning before you wake up can be as long as an hour. It is this dream you are most likely to remember.

Dreams can be dull or filled with wild adventure. They may be in color or black and white. Sometimes people dream they are falling or flying. Kids often dream about animals. Some people have an "exam" dream when they are worried. The dreamer suddenly discovers he must take a test—and he has forgotten to study for it. He is relieved to wake up and find he is off the hook.

Just why do people dream, anyway? There are several different explanations. A doctor named Sigmund Freud thought that dreams hide ideas that worry us. He said that troublesome thoughts would wake us if they were not disguised as something else.

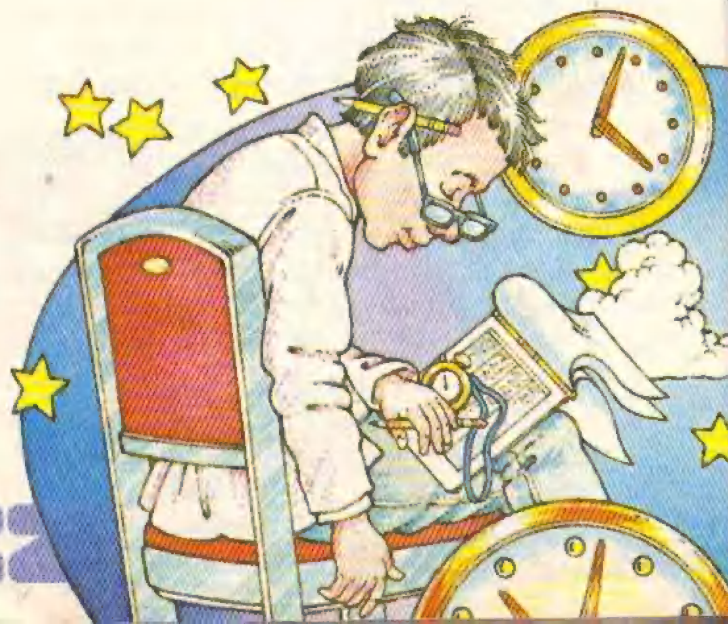
Some scientists disagree with his idea. They think that dreams are caused by the jumble of electrical signals that travel through the brain at night. They say that the brain tries to make sense of these confusing signals. For example, you may dream about being unable to move. Perhaps your brain is trying to explain the paralysis of REM sleep.

Why Do We Need Sleep?

Everyone needs sleep. But how much you need depends in part on your age. Babies sleep most of the time, about 20 hours a day. Kids need 10 to 11 hours each night until they reach their teens. Most adults sleep seven or eight hours nightly. Many people over 50 need even less rest. But even for people within the same age group, some need more sleep than others do.

Some people can get by with very little sleep. A high school student named Randy Gardner set a record for staying awake as part of a science fair project. He didn't sleep for 264 hours—that's 11 days. And on the last night, he was alert enough to play 100 games on a baseball machine in a penny arcade. When Randy finally went to bed, he needed less than 15 hours to catch up. He felt fine after the experiment. But in similar experiments, other people began to see things that weren't there when they stayed awake too long.

You will probably spend about one third of your life sleeping. That time is not wasted. No one really knows for certain what sleep does for people. But there are some researchers who think that



sleeping may be like cleaning house in your mind. You may use sleep as a time to throw out the junk you've learned and save the useful memories to file away. Other researchers think sleeping and dreaming help the brain to develop, just as food and exercise help to develop the body.

Troubled Sleep

The study of sleep isn't limited to everyday snoozing. Scientists study special sleep problems as well. When a doctor thinks a patient may have a certain sleep problem, that person may be asked to sleep overnight in a special bedroom in the lab. There is even a camera there so the sleeping patient can be filmed for more study later.

Sleep problems happen to people of all ages. But some of them are most common among kids. These problems include sleepwalking, night terrors and bedwetting.



People who sleepwalk are deeply asleep. The next morning, they don't remember their nighttime stroll. One sleepwalker told a researcher that everyone in his family walked in their sleep. He told a funny story about a family holiday reunion. He woke up one night in his grandfather's dining room and found himself surrounded by his sleeping relatives.

Another sleep problem that sometimes bothers kids is night terrors. The sleeper may sit up in bed and scream. His heart beats fast, and he breathes very hard. He seems frightened, but he goes back to sleep without ever completely waking up. Unlike a person who has a nightmare, he remembers nothing about the night terror the next day.

Sometimes a kid wakes up in the morning and finds he has wet his bed during the night. It might be embarrassing, but it's not his fault. Many kids wet their bed at night. Like sleepwalking, this is a problem that will go away as a kid gets older.

Tonight, as usual, you will go to bed. Once again you will enter the mysterious world of sleep. You will look like you have put your brain on standby. But, as you now know, you will be going through one of the busiest and most important parts of the day. Pleasant dreams!

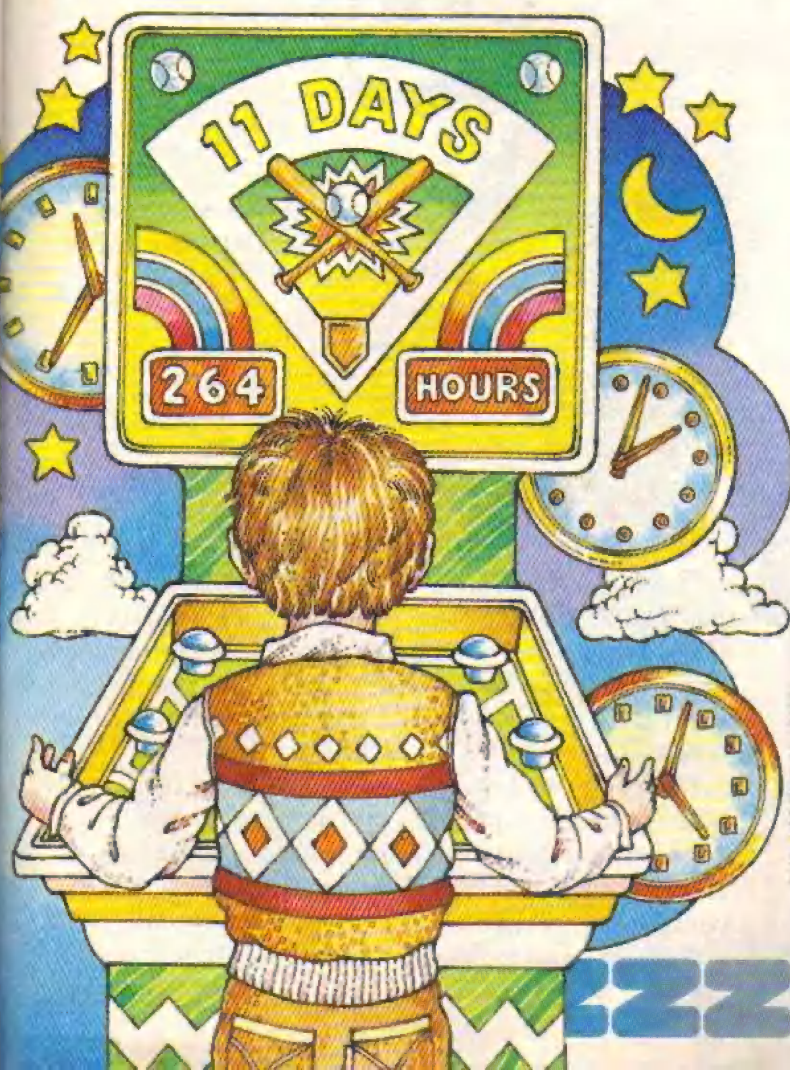


ILLUSTRATION © JOHANNEZ

Any Questions?

by Marc Derman

How does paint get its color?

Would you plaster aluminum on your wall? Or cover your latest art project with iron? Well that's what you're doing when you use paint.

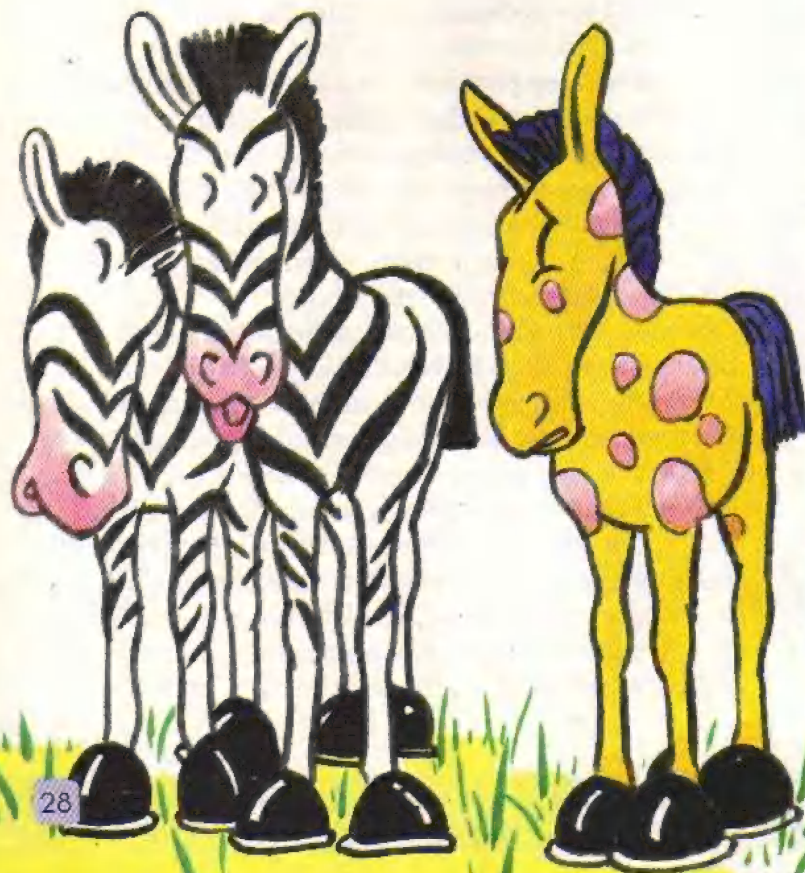
The colors in paint come from minerals and chemicals that are ground to a powder and mixed into a colorless liquid. For example, iron is used to color some paints red, yellow, orange and brown. Chemists make different shades by mixing the iron with minerals and with oxygen.

To make blue paint, aluminum is mixed with another mineral, sodium. Sometimes blue paint is made by grinding up a blue rock called lapis lazuli.

Yellow and red paints are also made from a mineral called cadmium. Cadmium, which is white, becomes yellow when it's boiled. Then when it's burned, cadmium turns bright red.

So next time you paint the town red, you can thank your minerals!

Question sent in by Paul Joffe, Knoxville, TN



What are genes? Genes made Kareem Abdul-Jabbar seven feet tall. Genes determine whether your eyes will be blue or brown and even give zebras their stripes.

Genes are too small to see, but their results are all over your face, and in everything you do. They are tiny bits of information made up of special molecules called DNA. DNA is the chemical blueprint that makes every individual unique. Each person has tens of thousands of genes to "tell" your body exactly how to grow.

Those tens of thousands of genes are lined up exactly the same way in every cell, like a string of beads. This string of genes is called a chromosome. There are 46 different chromosomes in every cell. Each cell has all the information to make you—you.

The genes you carry are a combination of genes from your mother and your father. And their genes came from their mothers and fathers. That's why you may have your mother's eyes, your father's chin and your grandfather's ears.

Question sent in by Julian Goldstein, Poughkeepsie, NY

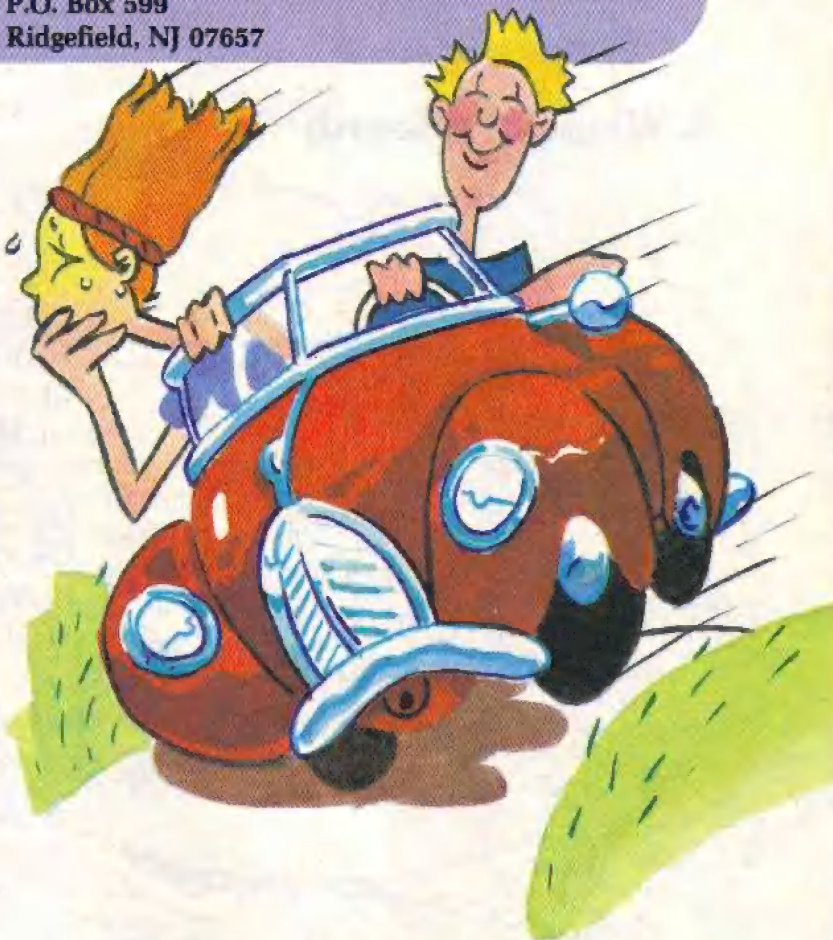
Do you have a question that no one seems able to answer? Why not ask us? Send your question, along with your name, address, and age, to:

Any Questions?
3-2-1 CONTACT
P.O. Box 599
Ridgefield, NJ 07657

Why do people get carsick? If someone tries to tell you that carsickness is all in your head, they're right! It's inside your ear to be exact. Part of your inner ear controls your sense of balance. When you're in a moving car that twists, turns or jerks forward, so does your head. That sudden movement can disturb your sense of balance and can make you carsick. The same thing can happen in a boat, or on a plane. It's called motion sickness.

Everybody knows how it feels. You may break out in a cold sweat and turn pale. You probably feel queasy and sometimes throw up. It's no picnic, that's for sure.

But plenty of people get over motion sickness. They suffer from it once or twice, then never again. When sailors stop getting motion sick, they say they've "got their sea legs." You can call it getting your "freeway legs," or your "air legs." Question sent in by Sara Martinka, Minneapolis, MN



Why do people say sugar is bad for you? Maybe this has happened to you: You eat a huge ice cream sundae, or a lot of candy, and about an hour later you feel worn-out, cranky, and you may even have a headache.

That's one of the things doctors say sugar can do to people. At first, it gives you a boost of energy, then it drops you lower than you were before.

Our bodies turn many foods into a kind of sugar called glucose, that gives us energy. Eating food with lots of sugar in it already is like putting rocket fuel into the family car. You may get a burst of energy, but it makes your system work too hard, and leaves you more drained of energy than when you began.

Another thing sugar can do is cause cavities. In your mouth, sugar mixes with bacteria to create acids. These acids eat away tooth enamel. The kinds of food that do the most damage are the sticky ones that cling to teeth, such as jellybeans, lollipops, caramels, licorice. Getting hungry? How about a piece of fruit? It tastes sweet, but it's much better for you.

Question sent in by Katie Lewis, Richardson, TX



ILLUSTRATIONS © BOB DELBOY

Extra!

by Ellen R. Mednick

A Whale of a Search

Get ready for a whale of a good EXTRA! just in time for July the Fourth.

W K A E B E S O O G
N C C T O O T H E D
A A R H T Y A T I S
R B O P T A M W F U
W P R P L R R H I L
H M E A E G I I N N
A U D P N L G T B I
L H S B O W H E A D
B L U E S V T E C S
I N T H E E S E K A

GOOSEBEAK
NARWHAL
BLUE
HUMPBACK
TOOTHED
ORCA
GRAY
BOWHEAD
WHITE

FINBACK
BOTTLENOSE
SPERM whale
RIGHT whale

Here's a whale of a riddle with a twist. We've given you the answer to the riddle. The question is spelled out in the leftover letters of the word search. To solve the word search, find the names

of the whales in CAPITAL letters above. They go across, up, down and diagonally. For the question, check the Did It! page.

The answer is Moby Grape.

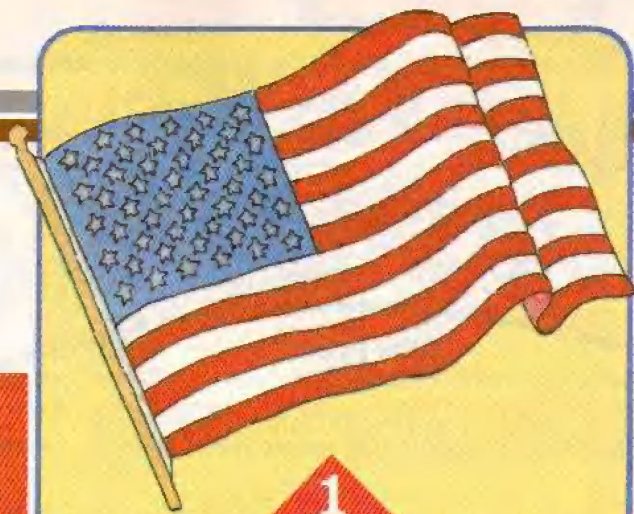
Adopt-A-Whale

You've read all about a family of humpback whales and how scientists identify and follow them. Here's a chance for your class or a group of friends to adopt a whale and to help other animals in danger.

The cost to adopt a whale is \$10. For that, you'll receive a certificate of adoption, a photo of your whale, a calendar and four issues of "Whalewatch," a newsletter that gives information about whales.

For more information, write to:

Whale Adoption Project
P.O. Box 316/C
Woods Hole, MA 02543



The Magic Four

What do the U.S. flag, the Statue of Liberty, sailboats and fireworks have in common? All four will be on display July Fourth. Here's a trick using this famous foursome. All you need is a copy of CONTACT, a paper and pencil.

What you do:

1. Open up to any page of the magazine.
2. Write down the page number of the left-hand and right-hand pages. (If the page number is missing, just write down the number that should be there.)
3. Add the numbers together for your first total.
4. Now open the magazine to another page.
5. Write down the two page numbers.
6. Add them together for your second total.
7. Subtract the smaller total from the larger one.
8. The answer will be your "Magic" number.
9. Starting with the flag, say one, then count two on the fireworks, three on the sailboat, and four on the Statue of Liberty.
10. Keep counting until you reach your number.
11. You will always land on Lady Liberty.

Happy July Fourth!



And Now For Dessert... Make Your Own Ice Cream

Summer is a great time for ice cream.

What You Need

- 1 tablespoon of unflavored gelatin
- $\frac{1}{4}$ cup of hot tap water $\frac{1}{2}$ cup of honey
- 1 cup of evaporated milk 2 cups of milk
- 3 teaspoons of vanilla extract
- $\frac{1}{2}$ cup of shelled nuts—walnuts, almonds
or pecans (if you like)
- a big bowl or pan

What You Do

1. Put the gelatin in the bowl and pour the hot water in. Stir until the gelatin is totally melted.
2. Add just one cup of milk and the honey. Stir until all the honey is blended in. If lumps form, that's O.K. Just beat it hard with a fork or a beater.
3. Add the rest of the milk, the evaporated milk and the vanilla. Mix it all well.
4. Set the freezer to the coldest point. Put

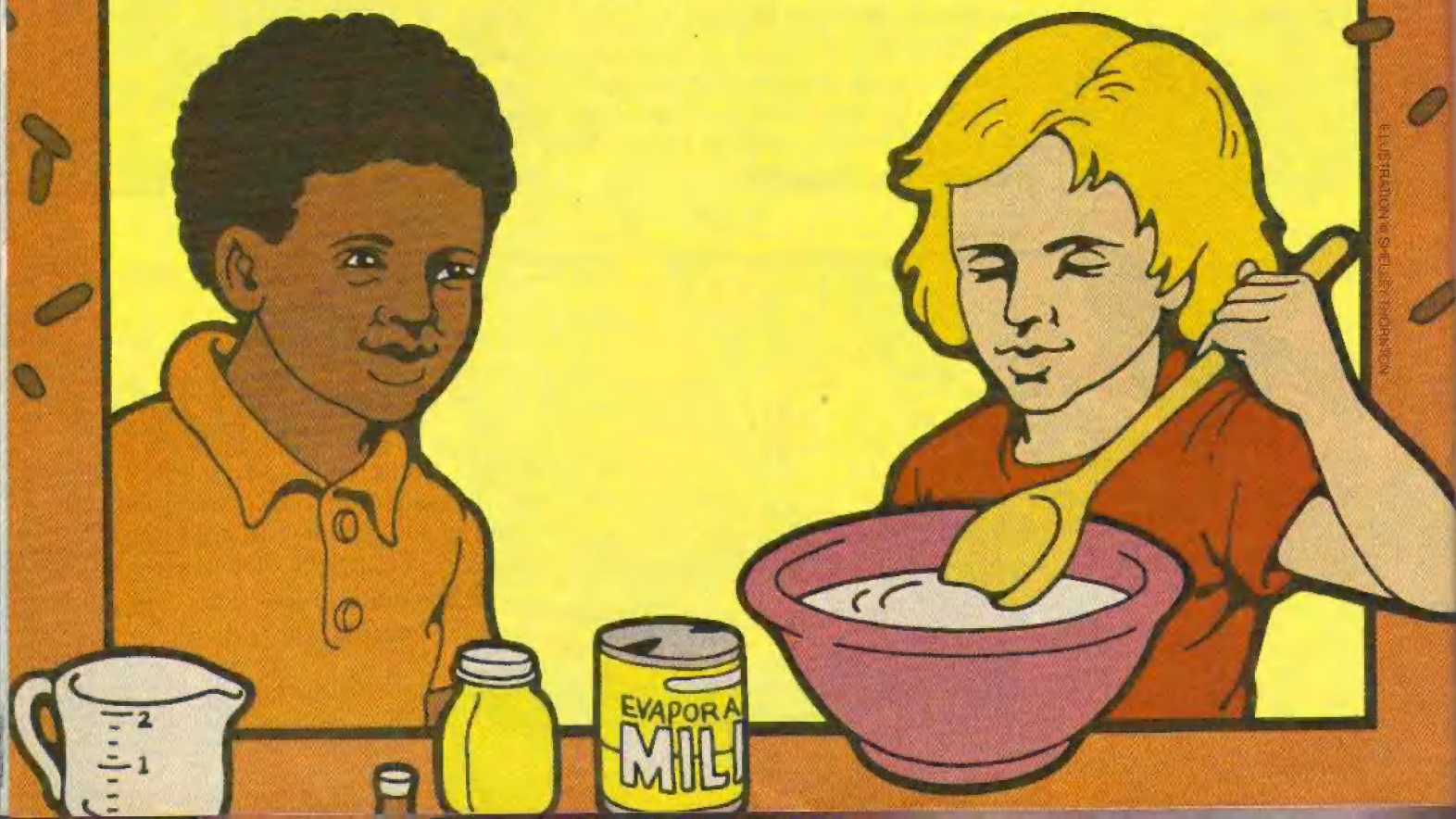
the bowl in the freezer.

5. When the mixture is partially frozen, in an hour or two, take it out of the freezer.
6. Beat with a mixer or eggbeater, until fluffy.
7. Add the nuts. Stir them in gently.
8. Put the mixture back in the freezer. In a couple of hours, it will be ready.

Tips

If the mixture doesn't get fluffy when you beat it, here's what you can do.

1. Put it back in the freezer for a half hour. Then continue with step number six.
2. If it's still not fluffy, melt a teaspoon of gelatin in a little hot water. Blend it into the mix. Put the mixture in the freezer for a half hour. Continue with step six.
3. If it still doesn't fluff up, put it in the freezer anyway. When it becomes frozen it will still taste good.



ENTER

THE HIGH-TECH WORLD OF COMPUTERS

Modem Maze

Computer-lovers go on vacation during the summer, but they don't always leave their computers at home. These two binary buddies

are sending messages to each other using their computers and modems. (A modem transmits computer data over regular telephone lines to another computer.)

Only one phone line connects the

boy in the city with the girl in the country. Can you find it? Then can you find a path between the phone lines that also connects them?

Answer on the Did It! page.

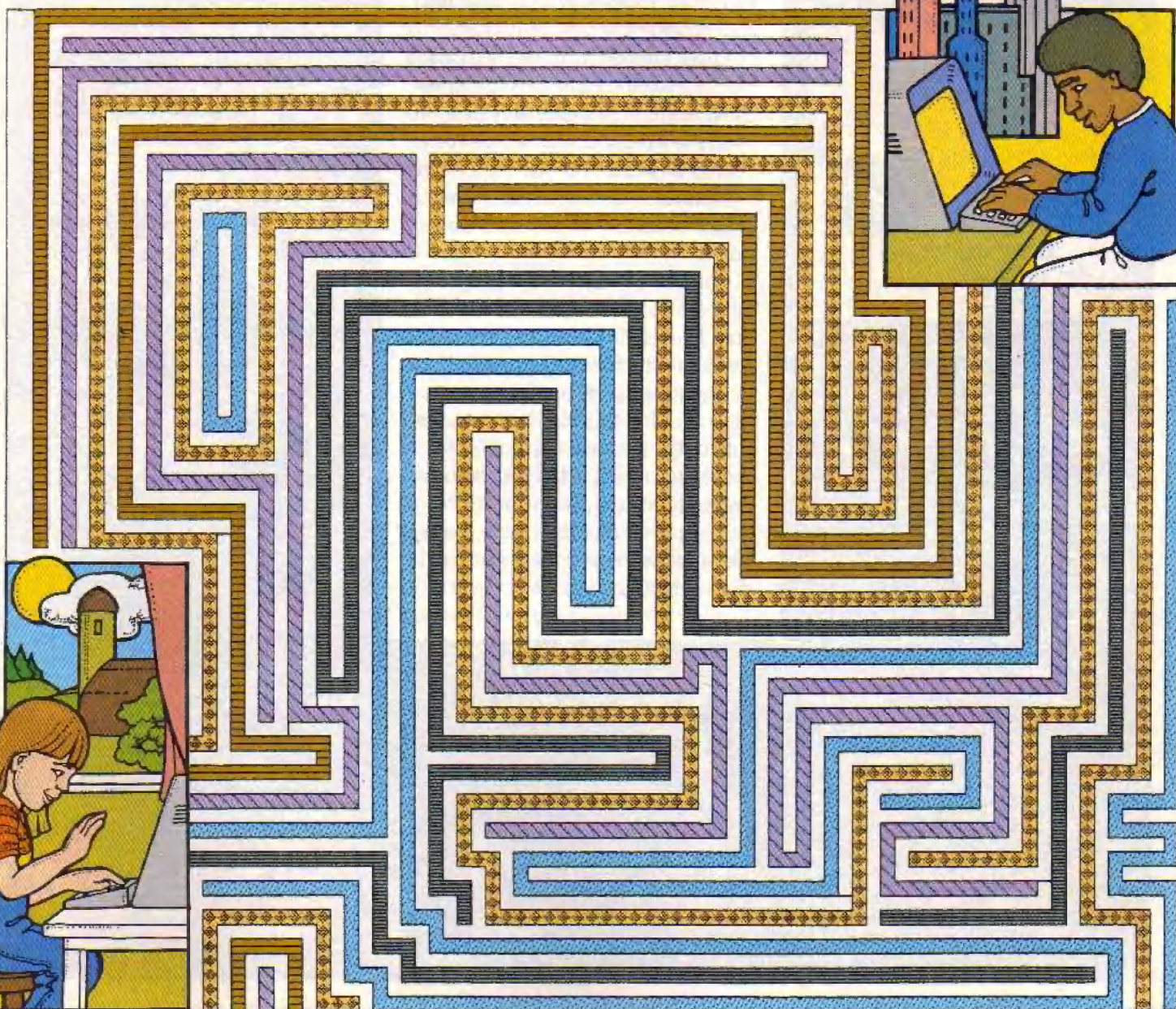


ILLUSTRATION BY CHRISTINA WONG

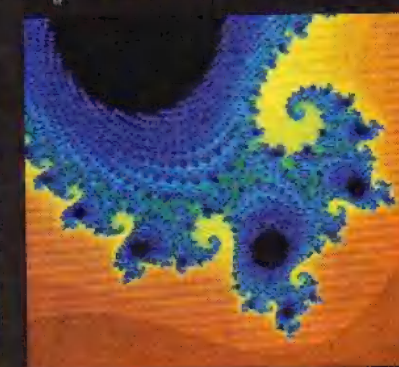
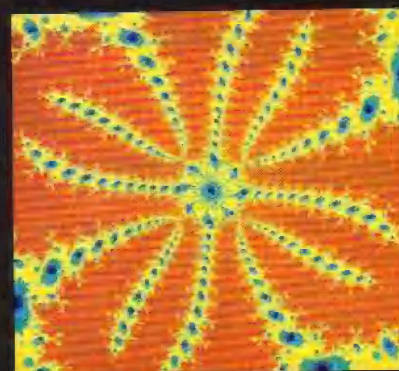
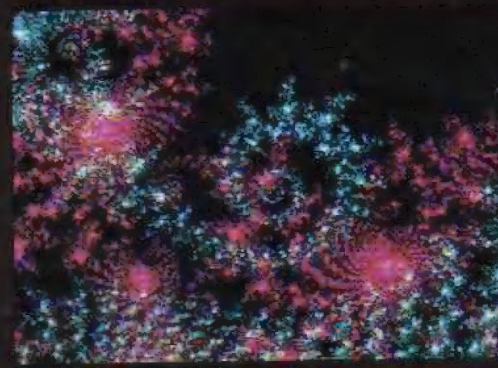
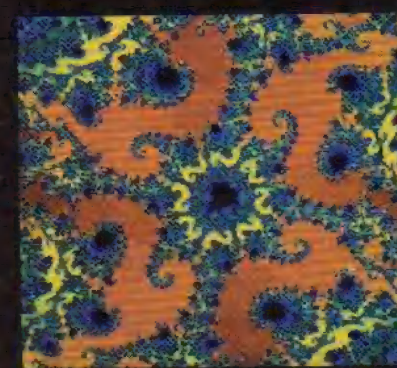
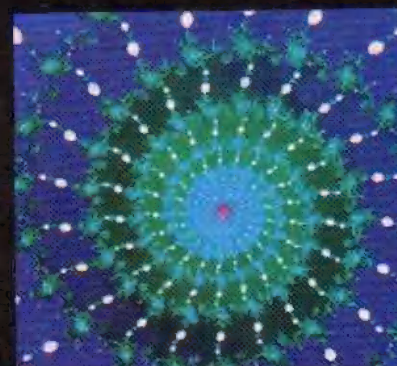
Space Age Art

by David Powell

What are these strange designs? Are they galaxies spinning through space? Waves on an alien sea? Space time-warps between universes? They may look like scenes from a sci-fi movie, but they're not. They are pictures of mathematical formulas, painted with a large IBM computer at Cornell University.

These special formulas are called *fractals*. Mathematicians are interested in them because they can produce irregular shapes, like ones found in nature. For example, they can draw a line that looks like a jagged coastline, or a mountain range.

Hollywood has already used fractal math to create special effects. *Star Trek II: The Wrath of Khan* and *The Last Starfighter* featured alien landscapes that were drawn with the aid of fractals. But besides starring in the movies, designs like these may one day help scientists to understand some of the beautiful and unpredictable things in nature, like a snowflake or the pattern of stars in the sky.



The Slipped Disk Show



ILLUSTRATION BY CAMERON EAGLE

Hi there, all you micro maniacs! It's summertime, and no one wants to be indoors answering a bunch of questions, not even your old buddy, Slipped Disk. So I decided to pack up and head for the beach!

It sure is nice out here. I've got my radio (so I can listen to myself), my pail and shovel, my sunglasses and beach ball. I even brought along a couple of questions to answer while I work on my suntan. Here's one from **Jenny Deibert**, of Slatington, Pennsylvania:

"Do computers ever make mistakes that aren't caused by human error?"

Jenny, computers seldom make mistakes. Oh, it's true that sometimes they use a salad fork on their mashed potatoes, but nobody's perfect, right?

Seriously, most computer errors are really human errors. If a human puts the wrong information into a computer, then the wrong answer will come out.

But like all machines, computers can break down. For example, when a computer stores data on a disk, it's possible for some of the information to be lost or changed. Or the circuits of the computer may become damaged. Then the computer may look like it's working while it's giving you the wrong answers.

So, Jenny, I hope that answers your question. And if anything I said turns out to be wrong, it's my computer's fault! (I probably shouldn't have taken it surfing.)

Anyway, it would be a real mistake not to answer the next question, which is from **Charity Baisden**, of Baltimore, Maryland. Charity asks:

"What is a microprocessor?"

Charity, you know that thing in your kitchen that can turn an entire head of cabbage into cole slaw in 1.7 seconds? Well, that's a food processor. It doesn't have much to do with a microprocessor, but I thought you'd like to know anyway.

Now, a microprocessor is the silicon chip in your computer that does the actual computing. Like all microchips, it has thousands of tiny circuits etched in its surface. All computers are made up of microprocessors and other chips, such as memory (RAM) chips.

The microprocessor has different parts. One part gets instructions from the program in the computer's memory. Another part keeps track of where it is in the program. Still another part does the actual computing by quickly repeating simple steps over and over.

And speaking of chips, I'd really

like some and a little onion dip, too. But first I'll answer one more question, from **Jenny Weigert** of Monroe, New York. Jenny wants to know:

"Are there any computers that you don't have to program to use?"

Jenny, all computers are programmed by somebody. For example, my computer was programmed by a guy who thought he was King Tut, Pharaoh of Egypt. (Which is why it's shaped like a pyramid.)

There are a lot of computers that have already been programmed by someone else. For example, cash machines in banks are computers, but you don't have to program one to use it. There are computers in automatic cameras, cars and even dishwashers, and they've all been programmed for you at the factory. In the future, we'll see more computers like these.

But that's the future. Right now, I'm going for a dip to cool off. See you next month and remember, send your computer questions to:

The Slipped Disk Show
3-2-1 CONTACT
1 Lincoln Plaza
New York, N.Y. 10023

Surf's up!

Slipped Disk contains no artificial preservatives.

REVIEWS

by Phil Wiswell and Bill Gillette



Pipeline

(Learning Technologies, Commodore 64/128, \$20; also available for the Apple II)

This game is not as easy as it looks. The Pipeline on-screen "board" consists of a 6x6 grid of rectangles. The program displays up to six objects around the edge of the board along with a water tap. Your job is to construct a single pipeline that brings water from the tap to all the objects. The catch is you only have eight differently shaped pieces of pipe to work with.

With each new level in the game, you have to connect more objects with your pipeline. Most of the problems have only one or two solutions, but you'll probably try many different paths till you find the right one. This is not an action game. It's a game where you have to think and plan ahead.

Wrap-Up

Bill: I didn't enjoy it. Probably younger readers will.

Phil: I disagree. I've seen several adults get caught up in the game. If you can't sit still without action on

your screen, then Pipeline is not for you. It's for puzzle-solvers.

Car Builder

(Weekly Reader Family Software, Apple II, \$39.95)

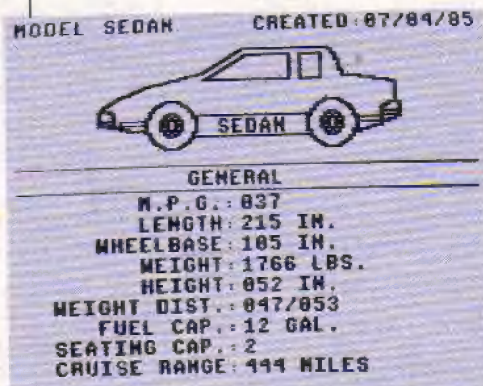
This is not a slam-bang car racing kit with lots of noise and crashes. It's a computerized construction set that teaches the principles of car design. Car Builder makes you think, create and explore many possibilities when building your car.

There are three steps in building a car. First, there's the mechanical design. Working from menus (lists), you select the frame, engine, steering, tires, etc. The second step is designing the body shape. Finally you put your creation on the test track and the program rates its performance. You may then add improvements to your car and test it again.

Wrap-Up

Phil: This is a fun activity that also teaches you a lot. It's good by yourself or with a group.

Bill: Car Builder is great!



The Great International Paper Airplane Construction Set

(Simon and Schuster, Macintosh, \$40; also for the IBM, Apple II and Commodore 64/128)

You might wonder about the title of this product. What do paper airplanes have to do with computers? Why should you spend \$40 on a computer program when you can make paper airplanes for the cost of a few sheets of paper?

Well, there are a few good reasons. This is a software and book package that contains some award-winning paper airplane designs. You can learn how to make beautiful bi-planes and superb supersonic transports. Some of the planes in the book are really strange, like the one that is just a wing.

You can also use the software to decorate the airplanes. And you can use your computer printer to print out airplane plans complete with fold lines and decorations. Best of all, the book and software will help you create your own.

Wrap-Up

Phil: Yes, it's fun, and yes, the planes look great when they've been printed out. But using a crayon or magic marker requires more creativity.

Bill: I disagree. There's a lot you can do with this program that you can't do on your own, like running off a squadron of planes with the same design.

Psi 5 Trading Company

(Accolade, Apple II, \$30; also for the Commodore 64/128)

This is a very good science fiction adventure. It is not an action/arcade game, but it feels like one when you play. Psi 5 is exciting, and you won't get bored with it for a long time.

It is the 35th century. You play the part of a captain of an intergalactic freighter trying to move supplies to hungry colonists. You have to deal with all sorts of space creatures who are blocking the shipping lanes.

Before starting, you "interview" applicants for your crew. Some are human, some are not.

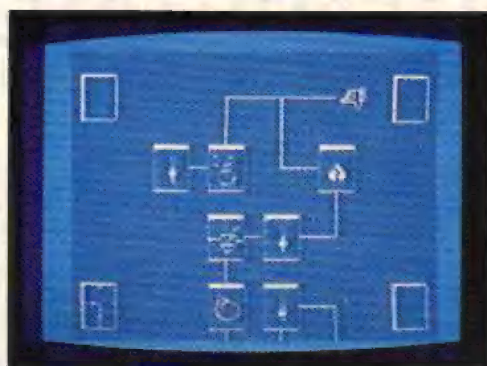
And that's the key to this game. If you choose a good crew and give them the right instructions, they will help you solve the game. If not, well, it's lonely in the captain's chair!



Wrap-Up

Bill: I love it. You have to remember everything, from ordering repairs to giving firing orders. After weeks of play, you may find something new.

Phil: Yes, like the fact that you've been choosing the wrong crew members! You must trust your instincts as much as the facts, an unusual twist that really makes this game click.



Alter Ego

(Activision, Commodore 64, \$49.95; also for Apple II, Macintosh, and IBM PC/PCjr)

The subtitle of this game is "A Fantasy Role-Playing Game About Life." If you don't know what that means, don't worry, because Alter Ego is so different from any other program that it's hard to describe. This is one of the most original disks in years, and you have to see it to really understand it.

The point of this game is to have fun living out someone else's life. You can buy either a male or female version of the game. Then you "become" that person (your "alter ego").

You select the stage of your character's life you want to experience. Then, well, you live by responding to situations the computer throws at you. The program keeps track of your performance in 12 categories including confidence, intellect and happiness.

Understand it now? We didn't think so. Still if you like fun and unusual experiences, take our word on this disk. You won't regret it.

Wrap-Up

Bill: I loved it. But some of the situations seem to repeat after you've played for a couple of days.

Phil: I didn't notice that. I thought it was original and fun.

Fontasy

(Prosoft, IBM PC, \$69.95)

Fontasy is a word processor with 28 built-in fonts. (A "font" is a style of type.) You can use any font you want anywhere you want, in the middle of a sentence or the middle of a word. The different type styles appear on the screen the way they will appear on paper.

The different fonts range in style from very common to very original styles with names like "Valentine" or "Banner." In the Christmas font, each letter is inside a Christmas tree ornament. The type sizes go from tiny Micprint to giant styles called Blox and Moon. There are also 275 extra styles available on other disks.

The program also allows you to produce your own graphics. You can create line drawings and fill them in with 95 different patterns.

Note: By the time you read this, a new, expanded version of Fontasy will be in the stores.

Wrap-Up

Phil: You not only get fonts and graphics with Fontasy, you get a word processor. This is a step beyond similar programs like The Print Shop.

Bill: Fontasy makes great looking letters and signs, but the word processing is not easy to use.



basic TRAINING

PROGRAMS FOR YOUR COMPUTER

Tell Me A Story

Apple, Commodore 64/128, IBM, TI
99/4A

Nowadays there are computer programs that write poetry, paint pictures, and make up music. Here's a program that will tell you a story. Of course, you have to provide it with the raw materials. It will ask you for nouns (a person, place or thing), verbs (action words) and adjectives (descriptive words). Once you've entered in the words, the program will make up as many versions of the story as you'd like.

You can change the story or make it longer. Just add lines after line 270. Wherever you want a noun to appear, pick one from the N\$ array. Verbs are stored in V\$, adjectives in A\$. K is a list of 20 random numbers.

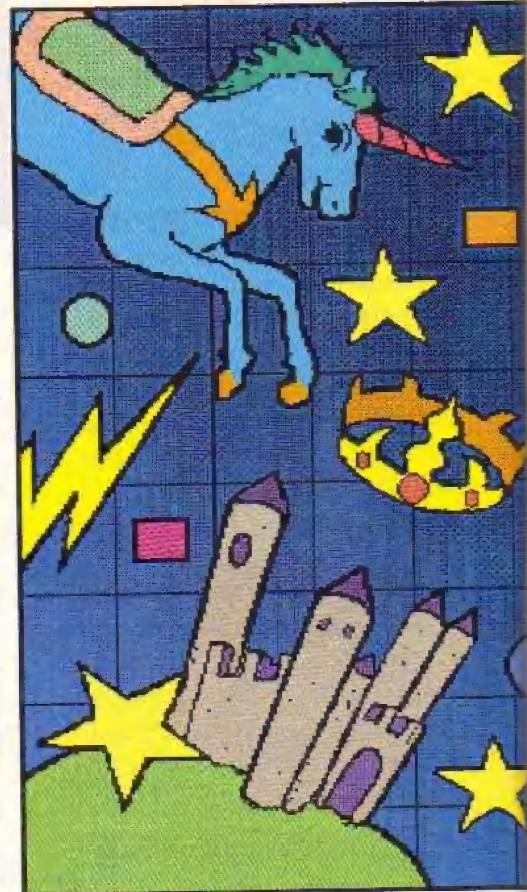
Below is the program for Apple computers. Following that are instructions for adapting it to Commodore and IBM machines, and a version for the TI 99/4A.



Apple

```

10 DIM K(20)
20 DIM N$(10), V$(10), A$(10)
30 HOME
40 PRINT "WELCOME TO STORY
PROCESSOR"
50 PRINT "PLEASE ENTER RAW
MATERIALS"
60 FOR DE = 1 TO 2000: NEXT DE
70 HOME: X$ = "NOUN"
80 FOR X = 1 TO 5
90 GOSUB 320
100 N$(X) = Y$: NEXT X
110 HOME: X$ = "VERB"
120 FOR X = 1 TO 5
130 GOSUB 320
140 V$(X) = Y$: NEXT X
150 HOME: X$ = "ADJECTIVE"
160 FOR X = 1 TO 5
170 GOSUB 320
180 A$(X) = Y$: NEXT X
190 HOME: GOSUB 350
200 PRINT "THE MAGIC "
;N$(K(1))
210 PRINT: PRINT
220 PRINT "ONCE UPON A TIME
THERE WAS A MAGIC ";
N$(K(1))
230 PRINT "THAT WAS VERY
";A$(K(2))
240 PRINT "ONE DAY THE MAGIC
";N$(K(1));" MET A ";A$(K(3))
;N$(K(4))
250 PRINT "'HELLO, ";A$(K(3));N$(
K(4));"'"
255 PRINT "SAID THE MAGIC
";N$(K(1))
260 PRINT "'WOULD YOU LIKE TO
";V$(K(5));"?"
270 PRINT "BUT THE ";N$(K(4));"
WAS TOO ";A$(K(6));" TO ";
V$(K(5))
280 PRINT "THE END"
285 PRINT: PRINT
290 INPUT "WOULD YOU LIKE A
DIFFERENT VERSION? Y/N":R$
300 IF R$ = "Y" THEN 190
310 END
320 PRINT "PLEASE ENTER A ";X$
330 INPUT Y$
340 RETURN
350 FOR I = 1 TO 20
360 J = INT ( RND (1) * 5) + 1
370 K(I) = J: NEXT I
380 RETURN
    
```



Commodore 64/128

Change these lines:

```

30 PRINT CHR$(147)
70 PRINT CHR$(147):X$ = "NOUN"
110 PRINT CHR$(147):X$ = "VERB"
150 PRINT CHR$(147):X$ = "ADJEC-
TIVE"
190 PRINT CHR$(147):GOSUB 350
    
```

IBM

Add or change these lines:

```

5 RANDOMIZE TIMER
30 CLS
70 CLS:X$ = "NOUN"
110 CLS:X$ = "VERB"
150 CLS:X$ = "ADJECTIVE"
190 CLS:GOSUB 350
    
```


TI 99/4A

```

5  RANDOMIZE
10  DIM K(20)
20  DIM N$(10), V$(10), A$(10)
30  CALL CLEAR
40  PRINT "WELCOME TO STORY
    PROCESSOR"
60  FOR DE = 1 TO 800
65  NEXT DE
70  CALL CLEAR
75  X$ = "NOUN"
80  FOR X = 1 TO 5
90  GOSUB 320
100 N$(X) = Y$
105 NEXT X
110 CALL CLEAR
115 X$ = "VERB"
120 FOR X = 1 TO 5
130 GOSUB 320
140 V$(X) = Y$
145 NEXT X
150 CALL CLEAR
155 X$ = "ADJECTIVE"
160 FOR X = 1 TO 5
170 GOSUB 320
180 A$(X) = Y$
185 NEXT X
190 CALL CLEAR
195 GOSUB 350
200 PRINT "THE MAGIC "; N$(K(1))
210 PRINT
220 PRINT "ONCE UPON A TIME
    THERE WAS A MAGIC
    "; N$(K(1))
230 PRINT "THAT WAS VERY
    "; A$(K(2))
240 PRINT "ONE DAY, THE MAGIC "
    N$(K(1)); " MET A "; A$(K(3)),
    N$(K(4))
250 PRINT "HELLO, "; N$(K(4)); "
    SAID THE MAGIC "; N$(K(1))
260 PRINT "WOULD YOU LIKE TO
    "; V$(K(5)); "?"
270 PRINT "BUT THE "; A$(K(3)),
    N$(K(4)); " WAS TOO "
    A$(K(6)); " TO "; V$(K(5))
280 PRINT "THE END"
290 PRINT "WOULD YOU LIKE A
    DIFFERENT VERSION? Y/N"
295 INPUT R$
300 IF R$ = "Y" THEN 190
310 END
320 PRINT "PLEASE ENTER A "; X$
330 INPUT Y$
340 RETURN
350 FOR I = 1 TO 20
360 J = INT(RND * 5) + 1
370 K(I) = J
375 NEXT I
380 RETURN

```

Alien Rock

Atari

Here's a program that makes alien rock. We're not talking about pieces of asteroid or boulders from another planet. We're talking about alien rock and roll. This program plays the top 40 hits from Mercury to Pluto. You can use a joystick to play your own space tunes.

Thanks to **Tad Doanne**, 10, of Cranbury, New Jersey, for this hit of a program.

```

10  POKE 559,0
20  A = STICK(0) : B = STRIG(0)
30  S = 53760
40  POKE S,30:POKE S+1,175
50  POKE S+2,31:POKE S+3,147
60  POKE S+4,29:POKE S+15,3
70  FOR X = 37.1 TO 250.44 STEP 0.91
80  POKE 712,X/3
90  IF A = 13 THEN N = 7:GOTO 130
100 IF B = 0 THEN NN = 2

```

```

110 IF A = 11 OR A = 7 OR A = 15 THEN
    N = 8:GOTO 130
120 IF A = 10 OR A = 9 OR A = 6 THEN
    N = 9
130 POKE S+N,X+NN:POKE 712,X/2
140 POKE S+N+1,X+NN+1
150 POKE S+8,STICK(0)
160 POKE S+2,STICK(0)+15
170 NEXT X
180 GOTO 10

```

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If you've written a program you'd like us to print, send it in. Include a note telling us your name, address, age, T-shirt size and type of computer. If we like it, we'll print it and send you \$25.

All programs must be your own original work. We cannot return programs. Please do not send disks.

Send your program to:

Basic Training
3-2-1 CONTACT Magazine
1 Lincoln Plaza
New York, N.Y. 10023

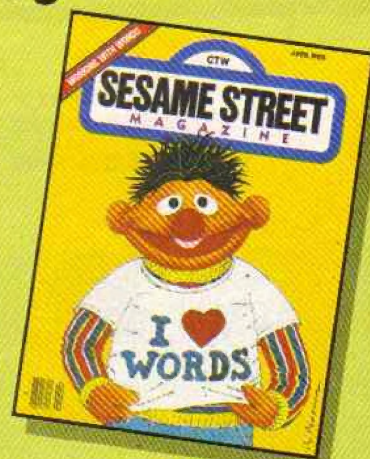


ILLUSTRATIONS BY MARTIN LEMELMAN

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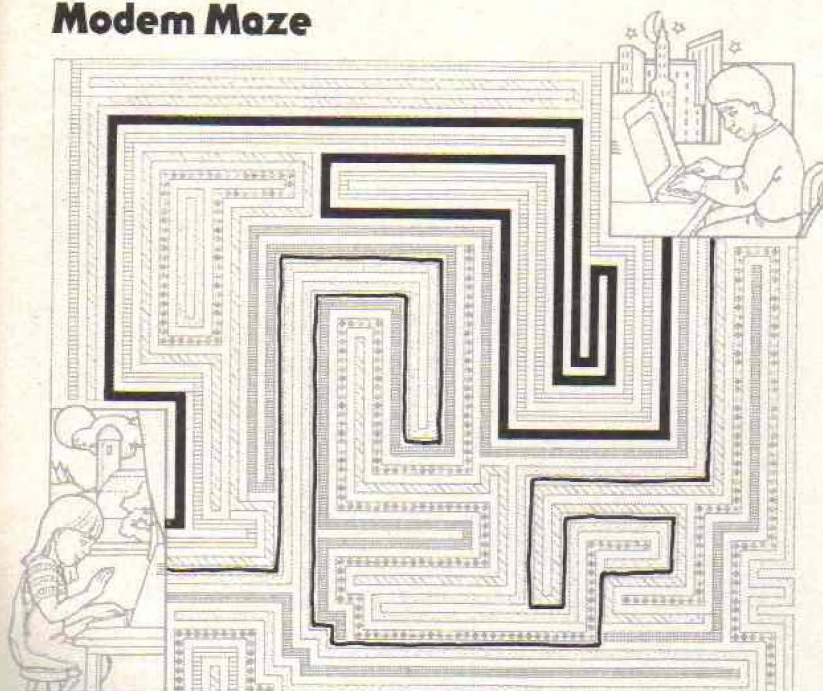
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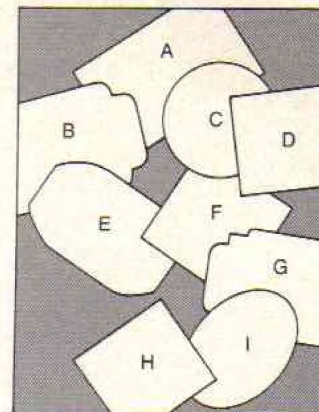


Did It!

Modem Maze



Cover Puzzle



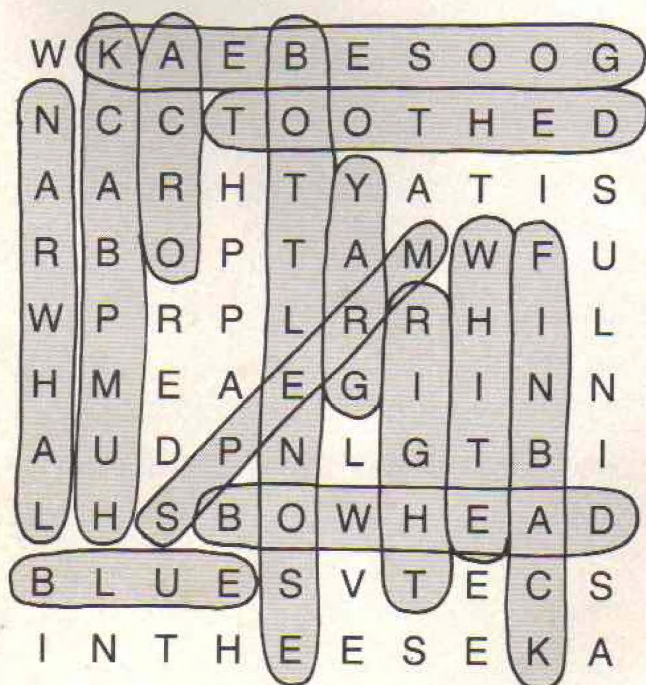
The answers are:

A. Niagara Falls, New York state and Canada (photo, © Gary Cralle/The Image Bank) B. The Alamo, San Antonio, TX C. Cable car, San Francisco, CA D. Disney World, Orlando, FL (photo, © William Albert Allard/The Image Bank) E. Empire State Building, New York City (photo, © Jake Rajs/The Image Bank) F. Lincoln Memorial, Washington, D.C. (photo, © Patti McConville/The Image Bank) G. Mt. Rushmore, South Dakota (photo, © G. Brimacombe/The Image Bank) H. Mississippi River Boat, New Orleans, LA (photo, Jules Zalon/The Image Bank) I. Liberty Bell, Philadelphia, PA.

Name That State

The answer is California.

A Whale of a Search



The question:

What is purple and lives in the sea?

Ooops, We Goofed!

In our May issue, we gave an incorrect credit for the girl baseball player on our cover. It should have read, Index Stock International/ Bruce Curtis photo.

Next Month!

Here's a quick look at what you'll find next month in 3-2-1 CONTACT.

Meet a Talking Chimp

Scientists are studying Kanzi, a chimp who is learning to communicate with humans.

Kids and TV

Is the "boob tube" bad for kids? Find out as we talk to the experts.

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